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OCTOBER, 1894.

A HISTORICAL SKETCH OF GERARD TROOST.

By Joseph W. England.

Historian of the Philadelphia College of Pharmacy.

An interesting historical sketch of Gerard Troost, first professor of chemistry in the Philadelphia College of Pharmacy, and first president of the Academy of Natural Sciences, of this city, has appeared in the June issue of the *Popular Science Monthly* (p. 258). Along with the sketch there is given a frontispiece of Dr. Troost, which represents him at a much later period in life than the accompanying portrait to this article, which has been taken from the oil painting in the Museum of the Philadelphia College of Pharmacy. The life of Gerard Troost was an eventful one. Born at Bois-le-duc, Holland, on March 5, 1776, he died in Nashville, Tenn., August 14, 1850. In early life, he attended the Universities of Leyden and Amsterdam, receiving the degree of doctor of medicine from the former, and master in pharmacy from the latter, in 1801. He practised for a while in Amsterdam and The Hague, served in the army, first as a soldier and then as an officer in the medical department, went to Paris in 1807 under the patronage of Louis Napoleon, King of Holland, and became the pupil and associate of the Abbé René Just Haüy, author of the famous system of crystallography. He then travelled in France, Italy, Germany and Switzerland, and collected a valuable cabinet of minerals, which was purchased by the King of Holland. In 1809, this king appointed Troost to accompany, in a scientific capacity, a naval expedition to

Java. The vessel in which he sailed was captured by an English privateer; he was confined for a time at Dunkirk, returned to Paris, and then made his way to La Rochelle. He took passage from a northern port beyond French jurisdiction, in an American vessel for New York, whence he hoped to reach the East Indies under the protection of our flag. The vessel was captured by a French privateer and taken to Dunkirk, where Troost was kept a prisoner until the French became aware of his true name and character, when he was released. He went at once to Paris, and in March, 1810, was elected a correspondent of the Museum of Natural History, of Paris. A few days afterwards, he embarked on an American vessel for Philadelphia.

The turn of affairs political in Europe, among which was the abdication of Louis Napoleon as King of Holland, and the surrender of Java to England, caused him to abandon his contemplated visit to the East Indies, and to remain in the United States.

In 1812, Dr. Troost participated in the meeting held January 25, in the house of John Speakman, apothecary, which resulted in the formation of the Academy of Natural Sciences, of Philadelphia. During his residence in this city, Dr. Troost was engaged in manufactures of various kinds. In 1815 or 1816, he began the manufacture of alum on the Magothy River, Cape Sable, Md., establishing the first alum works in the United States. In 1821, he was appointed professor of mineralogy in the Philadelphia Museum, and was made first professor of chemistry in the Philadelphia College of Pharmacy, from which latter position he resigned in 1822. He was the seventy-first member of the College, joining November 19, 1821, and resigning in 1822. During this period, he also made geological excursions into New Jersey and elsewhere, and it was to geological studies that he now bent all his energies. Removing first to Harmony, Ind., in 1825, and then to Nashville, Tenn., in 1827, he was elected in the following year, professor of chemistry, geology and mineralogy of the University of Nashville, and held this position for over twenty-two years. Here his life's best work was done, and his reports as State Geologist contributed not a little to an accurate knowledge of the rich mineral resources of the State of Tennessee.

STRUCTURE OF HEUCHERA AMERICANA.

By Edson S. Bastin.

The plant is botanically described as follows: Perennial, herbaceous, the above-ground parts from a short thick, knotty rhizome (*Fig. 1*), which usually gives rise to several heads and numerous conical or somewhat fusiform, branching roots; scapes usually one from each

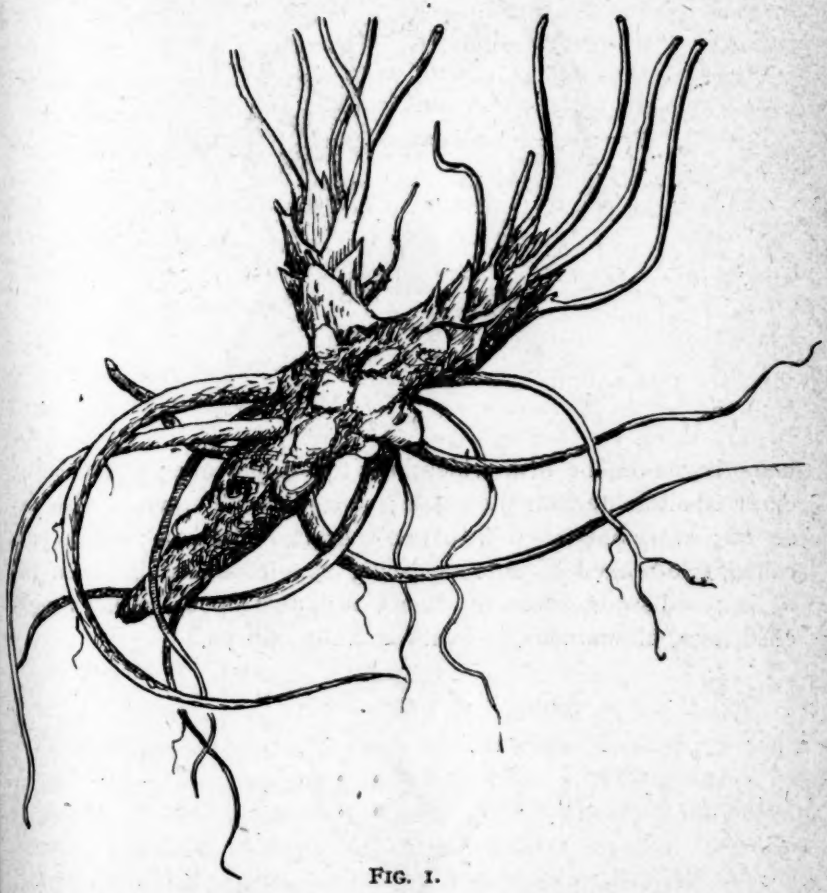

Fig. 1.

head, 2 or 3 ft. high, glandular and more or less hirsute with short hairs and bearing loose panicles of small, dull-colored flowers; leaves radical, long-petiolate, stipulate and with orbicular or broadly ovate, deeply cordate and bicrenate-margined blades which are more or less hirsute with short hairs; stipules adnate to the base of the petioles and the free portions inconspicuous, scarcely green; petioles cylindrical,

from 4 to 6 inches long; lamina 2½ to 3 in. long by 2¼ to 2½ in. wide, membraneous in texture and palmi-reticulate; flowers with a campanulate, regular calyx, whose base adheres to the base of the ovary and whose margin is five-cleft; petals small spatulate, entire, white, not longer than the calyx lobes, and alternating with them,

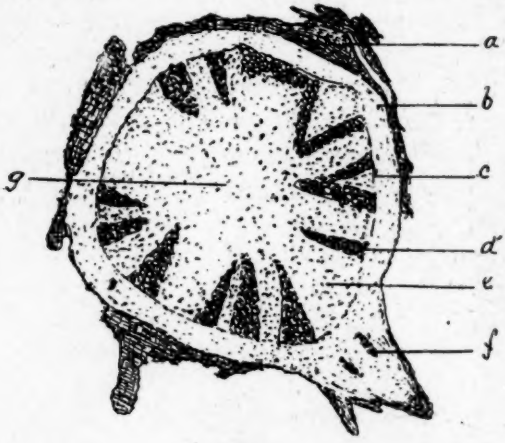

FIG. 2.

being borne on the disk which lines the calyx-tube; stamens five, exserted alternate with the petals; styles two, filiform and also exserted; ovary one-celled with two marginal placentæ; fruit a one-celled, two-beaked capsule dehiscing longitudinally between the beaks; and seeds, numerous, small, oval, anatropous, with a roughened testa, albuminous, and with an axile embryo.

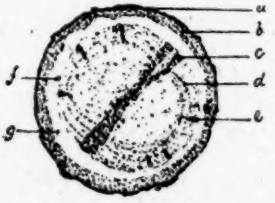

FIG. 3.

The plant is not uncommon in rocky wooded regions from Connecticut to North Carolina, and as far west as Minnesota and Illinois. By reason of the powerfully astringent properties of the root the latter is popularly called Alum Root. It has been much used by the Indians, and more or less in domestic practice, in medicine

as an astringent, and it doubtless merits the reputation it has acquired as a remedy for diarrhœa, aphthæ, menorrhagia, and for other disorders for which purely astringent remedies are employed.

The rhizome is fleshy, one-half or three-fourths of an inch thick, tuberculate, and often pitted, from two to four or five inches long, giving origin on its upper surface and sides to several short heads which are cylindrical, scaly from the numerous remaining leaf-bases, and often terminated by a concave stem-scar; from the sides and lower surface of the rhizome are emitted numerous roots, many of which are thin, but some of which may in the fresh state be as much as one-third of an inch in diameter.

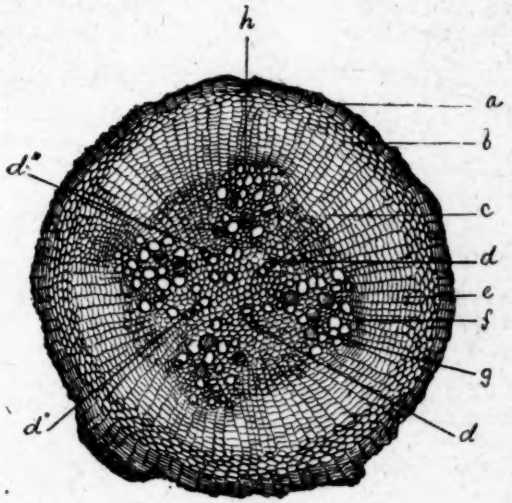

FIG. 4.

A cross-section of the rhizome shows a structure which is represented magnified about six diameters in *Fig. 2*. At the outside is a corky layer which is rough and unequal in thickness from peeling away at the surface; interior to this at *b* is a rather thin bark composed wholly of soft tissues, and then a large central cylinder with a few wedge-shaped radiating xylem masses arranged at irregular distances apart but always separated by broad masses of soft tissues; and there is a large central pith.

The cross-section of a root shows quite a characteristic structure. One of the roots magnified about six diameters is shown in cross-section in *Fig. 3*. The rough, corky exterior bark is shown at *a*,

the starch-bearing cortical parenchyma at *b*, at *g*, the inner layer of the bark wholly composed of soft tissues and containing little if any starch. But it is the woody cylinder that has the most characteristic structure. In many roots it appears crossed through its centre by a straight band of lignified tissue, consisting almost wholly of scalariform tracheids and ducts, mainly the former. This band is indicated at *c* in the Figure. Nearly all of the lignified tissue of the root is concentrated in this band, but a few small areas may be found on either side of it adjacent to the cambium zone. One of these is indicated at *e* in the Figure.

This appearance of the mature root is due to the fact that the

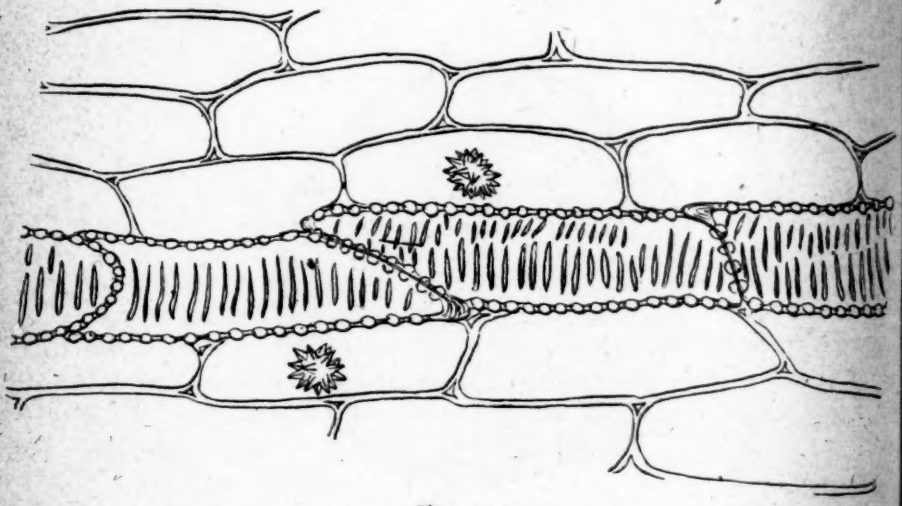

FIG. 5.

original radial bundle in the root is commonly di-arch, and during the course of the secondary changes it undergoes, it preserves its two-rayed character, the secondary formations, except narrow areas just back of each original phloem mass, producing but little lignified tissue.

The original bundles of the root, however, are not always di-arch; sometimes they are tri-arch, and sometimes tetrarch. Hence, an old or mature root may sometimes show three or four narrow xylem rays, instead of the straight band, shown in *Fig. 3*.

Fig. 4 shows the cross-section of a younger root, which, however, has undergone considerable secondary changes, and which

possesses a tetrarch radial bundle. One of the original xylem rays is shown at *d*, and the other three at *d'*, *d''* and *d'''*, respectively. At *g* and *h*, are two of the four secondary xylem masses, which, to the naked eye, in a cross-section of the root, present the appearance of a cross.

The ducts and tracheids of the xylem, both of the rhizome and roots, are nearly all of the scalariform variety, and the component cells of a row of tracheids, or of a duct, as the case may be, are short and oblique-ended, or taper-ended, as shown in *Fig. 5*. In consequence of their shortness and the markings on the oblique end-walls, an unusual number of the tracheids show the scalariform markings when viewed in cross-section.

These markings, as they appear in this view, are indicated in *Fig. 4* at *g*, and in various other of the tracheary elements, shown in the same figure.

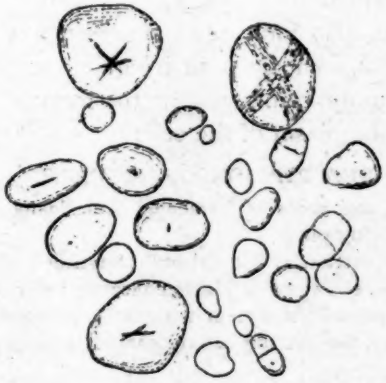

FIG. 6.

Starch is abundant in both the rhizome and the roots in most of the mature parenchymatous cells. The starch is small-grained and the grains are mostly simple, smooth and rounded or oblong and usually destitute of any very distinct markings. Only the largest grains show a fissure at the central or sub-central hilum. Sometimes these fissures have several rays and sometimes they consist of a single slit. Bi- or tri-nucleated grains are not uncommon and double or multiple grains sometimes occur. Concentric markings are seldom or never observable even in the larger grains, except by the aid of swelling reagents, and even then with difficulty. Only

the largest grains show a cross by polarized light. Even then the cross is very faint. The cross is usually somewhat oblique.

Old or mature roots contain great numbers of sphero-crystals of calcium oxalate, and these are frequently so arranged that when the transverse section of the root is cleared of its starch and proteids, it presents under a low power a somewhat annulate appearance. The rings shown in the woody cylinder in *Fig. 3* are due to this annulate arrangement of the crystal cells. Not all sections, however, show the annulate arrangement so distinctly as this one.

The tannin is the variety which produces a blue-black precipitate with ferric salts, and it occurs abundantly in nearly all the tissues of the root and rhizome, and more abundantly in the cell-walls than among the cell contents. The cork cells, especially the newer ones, appear to contain least of it. Old parenchyma cells that contain large quantities of starch also appear to contain somewhat less tannin than those which are younger.

The alcannin test also indicates the presence of small quantities of resin in the cells, sometimes in irregular or nodular masses of considerable size, more commonly in the form of minute particles imbedded in the protoplasm of the cells.

DESCRIPTION OF FIGURES.

Fig. 1.—A rhizome and roots of Heuchera Americana about natural size. Drawing made from living plant.

Fig. 2.—Transverse section of the rhizome magnified about six diameters. *a*, corky exterior layer, showing its friable character; *b*, cortical parenchyma; *c*, cambium zone; *d*, one of the xylem wedges; *e*, a broad medullary ray; *f*, xylem of a root bundle, the section having passed through the base of a root; *g*, pith.

Fig. 3.—Cross-section of one of the older roots magnified about six diameters. *a*, cork; *b*, cortical parenchyma; *c*, end of one of the secondary xylem rays; *d*, faint circle caused by the peculiar arrangement of the cells containing calcium oxalate crystals; *e*, a small mass of tracheary tissue in secondary xylem; *f*, cambium; *g*, soft bast layer.

Fig. 4.—Root as seen in cross-section, magnified sixty-six diameters. *a*, cork; *b*, cortical parenchyma, the outer cells of which are somewhat collenchymatous; *c*, medullary ray; *d*, *d'*, *d''*, *d'''*, original xylem rays of the tetrarch radial bundle; *e*, primary phloem; *f*, meristem; *g*, one of the tracheids in the secondary xylem, showing scalariform markings on the oblique end-wall; *h*, another of the four secondary xylem rays.

Fig. 5.—Small portion from xylem region in longitudinal section of root, showing row of scalariform tracheids and some of the adjacent parenchyma cells. Magnification 330 diameters. Two of the parenchyma cells contain sphero-crystals of calcium oxalate.

Fig. 6.—Starch grains from root of Heuchera magnified 800 diameters, one of the larger grains as viewed by polarized light, the others as seen by ordinary light.

PHILADELPHIA, September 17, 1894.

THE GRAIN WEIGHT.*

A STUDY OF WHEAT.†

BY J. U. LLOYD.

Historical.—The cereal *Triticum sativum* is the most valuable of food-producing plants, its seed, under the name of "wheat," being the principal bread-stuff of civilized nations. The plant is accepted by some to have been a grass that originated in the Mediterranean country, but this impression seems largely to be based on conjecture, and its origin as a food plant is probably lost in the darkness of antiquity.

Scripture mentions the plant, and by some persons its origin has been ascribed to ancient Egypt. China is said to have introduced wheat 2,700 years before Christ. These points are records of general history and pass comparatively unaltered through ordinary literature.

Standard modern dictionaries inform us that the weight of the fruit of this plant is the basis that 600 years ago in England was used to establish the grain weight. Most authorities make the same general statement to the effect that a plump grain of wheat was used as the standard employed to establish the grain, but Prof. Remington ("Remington's Pharmacy") gives the matter a historical record better than any other pharmacy work consulted, and with which, in a general way, my own researches agree.

As the statements of authorities as a rule coincide with that of Webster, it may be taken as typical, to wit:—"*Grain.*—The unit of

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*Read at the forty-second annual meeting of the American Pharmaceutical Association, Asheville, N. C. Contributed by the author.

†As a study of the grain weight in its connection with the grain of wheat, perhaps this paper is sufficient. As a study of wheat in an economic sense, many gaps should be filled. For example, England, New Zealand and Australia should each be averaged in an equal number of specimens to those of other countries. And now I desire to express my thanks to my friend, Dr. Sigmund Waldbott, who, with painstaking care, assisted in the detail work of the investigation, and to whose patience I am largely indebted for the completeness of this paper.—L.

the English system of weights, so called because considered equal to the average of grains taken from the middle of the ears of wheat." This would lead us to believe that a grain in weight should be the counterpart of an average grain of wheat.

Concerning the origin of the grain weight, C. W. Pasley, "Measures, Weights and Money," London, 1834, p. 8, says: "—those days of feudal ignorance, in which the standard of English lineal measure was referred to the average length of a barleycorn, and the standard of weight to the average weight of a dry grain of wheat from the middle of the ear," which might also lead to the inference that our present grain weight represented the weight of an average grain of wheat at the time of standardization.

But careful preliminary weighings, which I had made of good samples of wheat, convinced me that an inference drawn to that effect would be erroneous and that modern grains of wheat do not average a grain in weight. It is exceptional for a single abnormally large wheat grain to weigh a grain.

Giving the literature on the subject some further study, in order to find an explanation of the inconsistency mentioned, I arrived at the fact, that, while the grain weight actually represented the weight of average grains of wheat about 600 years ago, this standard was changed 200 years afterwards.

Johnson's Universal Cyclopædia, 1893, gives the following summary of that fact in the definition of the word "Grain": "*Grain.*—A statute of Henry III (in the year 1266) enacted that *32 grains* of wheat from the middle of the ear, well dried, should weigh a pennyweight, of which 20 should go to the ounce; but finally in the 12th year of Henry VII, the pennyweight came to be divided into 24 *grains.*"

Thus it is seen that 32 standard grains of wheat were used 600 years ago to establish the *pennyweight*, which then became the *unit* of weight. This pennyweight, about 200 years afterwards, was divided into 24 parts, and thus produced the number of grain weights (24) that now (providing no other changes were made in the standard) make a pennyweight. Hence, one pennyweight (or 24 grains in weight) should now balance 32 grains of wheat, if wheat still conforms in size and weight to the standard taken as an average of wheat in the year 1266. In order to conform to the standard employed by statute of Henry VII, 100 grains of wheat should only weigh 75 grains.

Comparison of Different Wheats.—We have thus (if no subsequent change was made) a well-established standard concerning the weight of wheat 600 years ago, and an average of the wheat of the world now should show us the effect that time and cultivation have had on the size of the fruit. It is not enough for this purpose to take the product of a single state, or of one country; a broad average should be made of the wheats of the world. This seed, like other plants, is affected by drought and climatic influences, and yet, an average of the wheat products of the principal wheat-yielding lands of civilization might give us a record that may be accepted as indicating either that the grain, so far as size is concerned, is being improved or is retrograding. The English grain weight has probably remained intact since its second standardization,* and if any change has occurred, it is to be looked for in the weight of the seed of the wheat. According to the statute of King Henry III (already cited), the standard grains are "well dried," and in the determinations made herein, well-dried is taken to have meant air-dried. We are told by the Century Dictionary that such countries as yield a surplus of wheat are the United States, Canada, Russia, Hungary, India, Australia, Egypt, Roumania and Turkey. In addition to specimens from most of these countries, I procured also specimens from New Zealand, England and several South American States. These specimens are taken from commercial lots, and are averages of such as are sold in large amounts in the grain market, all of crop 1893,† except Rosario, 1892.

Here I may add that most of the American as well as the foreign specimens were procured by Messrs. Smith, Hammond & Co., of Baltimore, to whom I was introduced through the courtesy of Messrs. Gale Bros., Cincinnati, O., and that Mr. Albert McCullough, of the firm of J. M. McCullough's Sons, of Cincinnati, cabled to London for Egyptian wheat,‡ and collected the Ohio and Wisconsin samples. To these gentlemen my thanks are herein extended; but for their aid the research would have been impracticable.

* "Fortunately, one unit common to troy, apothecaries' and avoirdupois weight has been saved—namely, the *grain*."—*Remington's Pharmacy, p. 35.*

† Weighings were made the second week in August, 1894. A loss of 6·77 per cent. resulted in dry wheat out of the harvest field after five days' exposure to a temperature of 138° F. in a drying-room.

‡ The Egyptian wheat did not come to hand in time to be included in this paper.

On comparing the samples it is seen that they can be divided into classes; one "red wheat," hard, compact, horny, elongated, usually slender, and of a red-brown, often dark, nearly amber color; the other, "white wheat," of larger grain, more plump, of usually chalky (starchy) fracture and of a yellowish-white color.

Since I found no record concerning the variety of English wheat that furnished the standard of the grain weight, it is unnecessary for us to separate the two classes, and hence, in this part of the paper I shall average them all.

One hundred grains were selected from each specimen, care being taken to select full, plump, smooth, perfect seeds of a uniform, large size. By comparing the wheat in the heads of wheat from our Ohio wheat fields, it was shown that by this method a close average could be made of the size of the middle grains of wheat of the head.

The result was as follows:

TABLE I.

ONE HUNDRED WHEAT GRAINS, OF UNIFORM SIZE, WEIGHED AS FOLLOWS:

*84·190	Grains,	No. 1, Club, Bombay, India.
*79·118	"	No. 1, Bombay, India.
*78·128	"	Choice, Bombay, India.
*77·890	"	Chili.
*77·878	"	New Zealand, White.
77·378	"	England, Red.
*74·430	"	California, Choice.
*72·083	"	New Choice, Bombay, India.
69·973	"	New Zealand, Red.
*67·836	"	Australia.
*66·593	"	Chili.
*64·838	"	England, White.
*60·343	"	California, No. 1.
*56·857	"	Kurrachee, Soft, White, India.
*56·638	"	Baltic, Russia.
55·318	"	Barletta, South America.
54·918	"	Calcutta, India.
*54·890	"	California, Blue Stem.
*54·668	"	Kurrachee, White, India.
54·190	"	Rosario, Argentine, 1893, South America.
54·164	"	Kurrachee, Red, India.
53·698	"	Patagonia, South America.
53·613	"	Ohio, Poole, Winter.
53·423	"	Azima, Russia.
51·983	"	Azima, Odessa, Fine.
51·853	"	Baltimore, Red, Winter.

51·431	"	Entre Rios, South America.
*51·403	"	Ohio, White, Winter.
49·543	"	Black Sea, Ghirka, Russia.
49·268	"	Ghirka, Fine.
47·828	"	† Chicago, Spring.
47·404	"	Wisconsin, Spring.
46·693	"	Duluth, Hard.
46·133	"	Black Sea, Azima, Russia.
46·078	"	River Plate, South America.
*45·658	"	Washington State.
43·908	"	Manitoba, Spring, Hard.
43·753	"	Rosario (Argentine), 1892, South America.
42·923	"	Odessa, Azima, Russia.
42·783	"	Ghirka, Fine, Russia.
40·478	"	Duluth, Spring.
37·448	"	Ghirka, Russia.

* Denotes white wheat, and it is obvious from this table that white wheat heads the list, as far as size of the grain is concerned.

† Northwest probably.

It would be erroneous, however, to base a commercial valuation of wheat (outside of appearance) solely upon the weight of the grain, and the second part of the paper will demonstrate some additional considerations that lead us to modify the results of such a valuation.

From the foregoing list the two following tables are abstracted:

I—AVERAGE WEIGHT OF WHEAT FROM EACH COUNTRY.

	Grains.
Australia and New Zealand	71·895
England	71·108
India	66·765
South America	56·119
United States and Canada	51·541
Russia	47·795
Total average	60·870

II—AVERAGE WEIGHT OF THE HEAVIEST SAMPLE FROM EACH COUNTRY.

	Grains.
India	84·190
South America	77·890
Australia and New Zealand	77·878
England	77·378
United States and Canada	74·430
Russia	56·638
Total average	74·734

Summary.—(1) Accepting that the standard grain weight was created from grains taken from the middle of a selected head of wheat, it is shown that from bulk lots of wheat that appear in most of the markets of the world, an average of the heaviest samples will yield a grain as heavy as was the grain of the original standard.

(2) The general average of all the samples is below the standard grain weight, being 60·870, when it should be 75·000.

(3) With two exceptions (England and New Zealand), white wheat headed the list as far as size of grain is concerned.

(4) Warm countries seem to yield the largest grain, and also contributed the greatest proportion of white wheat according to these samples. Thus, India furnished but one specimen of red wheat out of eight considered, and supplied three specimens to head the list in comparative weight, while Russia furnished but one specimen of white wheat (which, however, came from the Baltic Provinces) out of nine samples, and averaged last in the list (see table I)

Standard modern dictionaries and other authorities inform us that the grain weight was established in England 600 years ago, from the weight of carefully selected wheat grains. (Webster, Pasley.)

From these statements an inference might be drawn, as though the average wheat grain should equal a grain in weight. Experiment shows, however, that it is exceptional for a grain of wheat to weigh as much as a grain.

This seeming contradiction is readily explained by the historical fact, viz.: that by statute of King Henry III (1266), it was enacted that 32 grains of wheat, from the middle of the ear, well dried, should weigh a pennyweight; and that in 1497, by statute of King Henry VII, this standard was changed, inasmuch as the same pennyweight was then subdivided into 24 grains. (See Johnson's Cyclopædia.)

Thus, until 1497, 32 average grains of wheat weighed 32 grains, providing grain-weights were then employed; but after the enactment of Henry VII, the 32 grains of wheat weighed but 24 reconstructed grains. Since then the grain standard, so far as I can determine, has suffered no further change; 100 average grains of wheat should therefore weigh 75 grains.

In comparing with one another the weights of forty-two separate lots, each of 100 grains, from specimens of wheat from different countries (Australia, England, India, Russia, South America, United

States and Canada), the general average in the weight of wheats from all the before-named countries (see Table I), was found to be far below the given standard, it being only 60·87 grains. However, an average of the heaviest of the specimens, one from each country, came very close to that of the original standard, viz.: 74·734, instead of 75 grains.

This would seem to show that cultivation and climatic conditions, during a period of 600 years, have exercised but little, if any, influence on the weight of selected wheat.

A MICROSCOPICAL AND CHEMICAL EXAMINATION OF CLOVES.

By Henry Kræmer.

More than a year ago, a sample of a spice was submitted to the author, an examination of which revealed the presence of a large quantity of starch. The question was then asked: "How much is there of this adulteration?" A quantitative answer was desired without a chemical analysis. This was the beginning of the present work, and very naturally the thought arose—Is it possible to obtain quantitative as well as qualitative results with the microscope? The results are embodied in this paper—which is intended, however, merely as a preliminary paper—on the comparison of quantitative microscopical with chemical examinations, and, it is hoped, will reveal the possibilities of research in this direction. At the same time are given the results of analysis of some commercial samples of clove oil and cloves by Thoms' method (with perhaps a slight modification) of determining the eugenol in the form of a benzoyl compound.

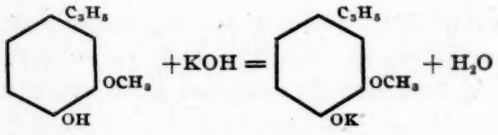
Extraction of Oil from Cloves.—10 grams of the powder were mixed with 10 grams of dried calcium sulphate, wrapped in filter-paper and extracted in a Soxhlet apparatus by means of petrolic ether. Some of the ether was recovered, and the remainder was siphoned off by means of a siphon and a suction of air. The oil thus obtained had a viscous appearance, and on the addition of alcohol, about 0·16 per cent. of a white resinous compound separated, which on the filter assumed the form of a very fine gauze. To this filtered solution, from 8 to 10 cubic centimetres alcoholic potash solution (1 cubic centimetre = 0·09856 KOH) were added. The

alcohol was removed on a water-bath, and to the nearly dried mass, from 2 to 2½ cubic centimetres of benzoyl chloride were added. The mixture, in a flask similar to that in which the extraction had been done, was stirred with a glass rod until the reaction was complete. Water containing some KOH was then added, and the whole heated on a water-bath for a few minutes, then removed and placed in ice-water, and, when cooled, the clear liquid decanted, and if there were any floating oily particles, these were removed in a separatory funnel by means of ether. This washing was continued three or four times, and finally the benzoyl eugenol was separated from the water by means of a separatory funnel with ether. The ether was evaporated off (assisted by siphoning the vapor and the use of the suction of air). The mass, on cooling, crystallized. These crystals were dissolved in 15 cubic centimetres of alcohol (90 per cent.), heated to solution and recrystallized by placing in ice-water and shaking the flask repeatedly. The solution was decanted and filtered through a small filter from the crystals, and the latter simply washed with an additional 15 cubic centimetres of alcohol (90 per cent.). The crystals in the flask with filter paper were dried at 100° C., and then weighed.

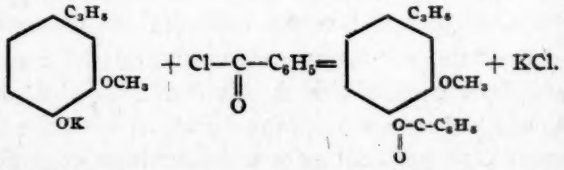
1 gram eugenol requires ·341 gram KOH.

1 gram eugenol requires ·693 benzoyl eugenol.

5 cubic centimetres alcohol (90 per cent) will dissolve ·110 gram benzoyl eugenol.



Eugenol. Potassium Eugenol.



Potassium Eugenol. Benzoyl Eugenol.

Thoms has worked out an algebraic formula for hastily calculating the results, which may be translated as follows:

a = weight of benzoyl eugenol.
b = weight of oil taken.
c = + 0·110 gram for every 5 cubic centimetres of alcohol used (being the weight of benzoyl eugenol dissolved in 90 per cent. alcohol).
x = per cent. of eugenol.
Molecular weight of eugenol = 164.
Molecular weight of benzoyl eugenol = 268.
Then

$$268 : 164 = (a + c) : \text{weight of eugenol.}$$

$$\text{Weight of eugenol} = \frac{164\,(a + c)}{268}$$

$$b : \frac{164\,(a + c)}{268} = 100 : x$$

$$x = \frac{164\,(a + c)\,100}{268b}$$

$$x = \frac{4100\,(a + c)}{67b}$$

The following results have been obtained by this method from the commercial samples of powdered cloves and clove oil:

Powd. Cloves.	*Per Cent. Oil.*	*Per Cent. Eugenol.*
No. 1	17·50	59·74
No. 2	17·75	60·45
No. 3[1]	12·75	66·16

[1] This sample was determined by the microscope to contain powdered clove stems, although sold by a large house in New York as powdered cloves.

Clove Oil.	*Per Cent. Eugenol.*
No. 1	76·06
No. 2	78·12
No. 3	83·45

Coming to the subject of quantitative microscopical analysis, while accurate results may be possible, so far, only approximate figures have been obtained. These may not be without interest and value, and it seems probable that an analyst who is able to use the microscope may, by a few moments' careful examination, obtain evidences that will materially aid him in subsequent chemical analysis. Regarding the statements made by some that "the results of microscopical examination are not always uniform," I must refer them to

the non-conformity in results of analytical chemists in organic and even in inorganic analyses, unless by practice the individual masters the difficulties. And again, it has been recently said, "that in the case of the deterioration of vegetable drugs through atmospheric influences or age, as well as in the adulteration of a genuine with inferior drugs, the difficulty of determining with the microscope the respective extent of change or adulteration is almost insuperable." This may seem to be so, and while chemical analysis is necessary, still there are many cases where the quantitative determination of admixtures and adulterations, if they are to be determined, can be done so only by means of the microscope.

It would not be a hard matter to prepare a lengthy paper on the difficulties attendant upon research in this direction. Was there anything more difficult a few years ago than the study of bacteria? Not until Koch devised a convenient and comparatively easy method for this kind of investigation, did this department, which to-day is recognized as a branch in science, become so popular. Even the medical student of the first and second year is taught to recognize and diagnose the insignificant bacillus tuberculosis.

As has been said before, this paper is but a preliminary one, and while the author has been at work upon the subject for some time, the work has been done under rather disadvantageous circumstances, and it is presented at this meeting to elucidate a principle, and present the results of what may be an incomplete method, for your consideration. The method of procedure is as follows: A measured quantity (about ·200 gram) of substance is thoroughly mixed with a measured amount (2 or 3 cubic centimetres) of water. One, two or three drops, formed on the finger, of this mixture, are placed in the slide and covered with a cover-glass. In the eye-piece of the microscope is slipped a piece of glass, corresponding to an ocular micrometer, containing 100 square millimeters. By a little practice, a slide may be prepared that is fairly uniform, or uniform places upon it may be selected. This being done, then a count is made of the number of starch grains, fibres, or characteristic tissue in the spurious substance, contained in 100 square millimetres, and the same compared with a genuine sample. For instance, mixtures were made of genuine cloves with potato-starch, wheat-starch, cedar-wood, turmeric, and it was observed that quantitative relations by comparison do, to some extent, hold even in this crude way of procedure. In determining the oil a slightly different method was pursued.

I. A sample of pure potato-starch was examined and 100 (mm.)^2 was found to contain (32 + 28 + 32 + 35) 127 starch grains. Another 100 (mm.)^2 contained (32 + 30 + 28 + 30) 120 starch grains.

II. A sample of powdered cloves admixed with 50 per cent. of potato-starch yielded the following results:

(1) (14 + 15 + 12 + 15) 56 grains = 45·34 per cent.
(2) (13 + 11 + 18 + 13) 55 " = 44·53 "
(3) (17 + 16 + 16 + 13) 62 " = 50·20 "

III. A sample containing 30 per cent. of potato-starch:

(1) (10 + 10 + 11 + 11) 42 grains = 34·00 per cent.
(2) (7 + 10 + 11 + 8) 36 " = 29·14 "

IV. A sample containing 20 per cent. of potato-starch:

(1) (7 + 8 + 7 + 8) 30 grains = 24·29 per cent.
(2) (7 + 6 + 9 + 9) 31 " = 25·10 "

V. A sample containing 10 per cent. potato-starch:

(1) (4 + 2 + 3 + 2) 11 = 8·90 per cent.

VI. A sample of pure red cedar yielded the following:

(1) (10 + 10 + 8 + 9) 37 fibres to 100 (mm.)^2.

VII. Cloves containing 20 per cent. red cedar yielded:

(1) 7 = 18·91 per cent.
(2) 9 = 24·35 "
(3) 8 = 21·60 "

VIII. Cloves containing 10 per cent. red cedar yielded:

(1) 4 fibres = 10·8 per cent.
(2) 3 " = 8·10 "

All of the above results were obtained by using ¼-inch objective. In the examination of turmeric ½-inch objective was used.

IX. Turmeric pure using one part of water:

(1) (11 + 11 + 6 + 5) 33 grains.
(2) (7 + 8 + 6 + 5) 26 "
Average × 2 = 118 "

X. Cloves containing 10 per cent. turmeric, using two parts of water:

(1) 10 = 8·47 per cent.
(2) 11 = 9·32 "
(3) 10 = 8·47 "

While the above results show a variance, and one that is not constant in any one direction, still they are of some encouragement. Hoping that the possibilities of this kind of research were not limited to mechanical admixtures, the author experimented with the view of obtaining quantitative results upon the oil contained in cloves. For this purpose a small extractor, graduated to a mark, was made out of a piece of glass tubing. This was filled to the mark with cloves and exhausted with ether, the whole operation requiring about one minute. The ether containing the oil was allowed to drop in a watch crystal containing a few drops of alcoholic KOH solution, the potassium eugenol forming at once and the ether evaporating. To the residue was then added a known quantity (2–3 cubic centimetres) of water, the mixture thoroughly stirred, and a drop of the liquid collected on the finger and used on the slide; 25 $(mm.)^2$ were examined and the number of $(mm.)^2$—approximately—filled with crystals were counted.

XI. Pure sample of cloves:

(1) 9.
(2) 6. } Average = 8.
(3) 9.

XII. Sample containing 50 per cent. of cloves of original sample contained:

(1) 4.
(2) 3. } Average = 11 = 45 per cent. oil.
(3) 4.

Three commercial samples were examined, one that was said to contain much allspice. An examination based on the "port wine" cells of allspice yielded the following results:

XIII. Genuine allspice sample yielded:

(5 + 9 + 3 + 3) = 20 "port wine" cells.

XIV. Commercial sample gave:

(3 + 3 + 4 + 3) = 13 "port wine" cells = 65 per cent. allspice.

A sample supposed to contain a large amount of wheat-starch yielded a surprisingly small amount comparatively, as was shown conclusively on comparing with pure mixtures of wheat-starch and cloves:

XV. Pure sample of wheat-starch contained:

(69 + 68 + 67 + 69) 273 grains.

XVI. Sample of cloves containing 25 per cent. of wheat-starch:

(16 + 19 + 16 + 18) 69 = 25·28 per cent.

XVII. Sample of cloves containing 10 per cent. of wheat-starch:

(13 + 9 + 7 + 10) 39 grains = 14·2 per cent.
(9 + 7 + 9 + 8) 33 " = 12·0 "

XVIII. Commercial samples, adulterated with wheat-starch:

(1)	100 $(mm.)^2$	=	18
(2)	"	=	24
(3)	"	=	28
(4)	"	=	24
			4)94
			23·5

The sample contained, therefore, 8·93 per cent. of wheat-starch —probably 10 per cent.

XIX. Commercial samples with a slight clove odor. Under the microscope, this revealed the presence of clove stems and starchy material. It yielded scarcely any potassium eugenol, but a green-colored liquid to ether. This sample showed adulteration, and either an extraction of oil by distillation or loss of oil.

Anyone who has labored with microscopical work for other than mere pleasure can readily comprehend the difficulties that must have been overcome by the author in this investigation thus far. And they who will attempt to corroborate these results, or do original work in this direction, must not be disappointed if results are not at once forthcoming. "Nature is taciturn and one must wrench her secrets from her." But after these secrets are well obtained and the way discovered, the work is not so difficult.

The author hopes to elaborate upon the principles contained in

this article, and that by similar methods, especially extraction and micro-chemical tests, the more important plant constituents even may be determined in a quantitative manner. Smaller squares than millimetres may be employed. Instead of tests being made upon a few milligrams of material, several grams should be used to obtain more uniform results. It is believed that by preparing carefully a series of powders with the adulterants, fairly accurate results may be obtained—certainly sufficient to determine approximately the extent of adulteration without recourse to elaborate and prolonged chemical analyses. By employing the most accurate methods of sampling in use in the assay laboratory, samples must be obtained that are representative. Enlargements by photo-micrography, and subsequent cutting out and comparing by weight the tissues printed and the part remaining, may be of service. Finally, much time must be yet devoted in ascertaining the real and permanent value of quantitative microscopical results to that of chemical results. It is hoped that many will pursue similar lines of research.

THE NAMES OF MEDICINAL PLANTS OF COMMERCIAL VALUE THAT ARE GATHERED IN NORTH CAROLINA: THEIR VALUE, AND RELATIVE AMOUNT SOLD IN THIS COUNTRY AND EXPORTED.*

By William Simpson, Raleigh, N. C.

North Carolina has been facetiously termed a strip of land between two States, and if we wish to know something of its products, by reference to the geographies of the country, we learn that it is celebrated for its tar, pitch and turpentine. It is with a view of bringing more prominently to the notice of the members of the American Pharmaceutical Association the wonderful resources of North Carolina that I have accepted the query proposed.

North Carolina, from its position in the Union, being about midway between the North and South Atlantic States, is blessed with a climate that partakes of the extremes of neither, and presents the only instance where the influence of latitude is compensated for by that of longitude. Beginning at its eastern boundary, where its

* Read at the meeting of the American Pharmaceutical Association, held at Asheville, N. C., September, 1894.

shores are washed by the tempered waters of the Gulf Stream, we have the palmetto, the live oak, and the sugar cane; and proceeding westward, we attain an altitude of 6,700 feet, the highest point east of the Rocky Mountains, where we find the fir, the hemlock, the balsam and the white pine, thus representing all the varieties of soil and climate, from Florida to Canada. Indeed, it may possibly be a matter of surprise to many of you to know that were North Carolina wheeled about so as to occupy a position directly north and south, it would extend across the States of Virginia, Pennsylvania and New York, and over Lake Ontario into Canada.

The gradual increase in elevation from east to west secures to the State a variety of climatic influence that would be gained by twenty degrees of latitude.

North Carolina has been a favorite field with the most distinguished botanists. From Bartram, who made his tour in 1776, the elder and younger Michaux, from 1787 to 1802, down to the later botanical explorers, Dr. de Schweinitz, Nuttall, Dr. Gray, Mr. Cary, who explored the higher ranges of our mountains in 1841, and our own Dr. Curtis—all agree that nowhere on the American continent are trees to be found of such beauty, value and variety, as in North Carolina. Many of the trees and shrubs now familiar to European ornamental and economic uses were introduced from this State, among which are the locust (Robinia pseudacacia), the tulip tree (Liriodendron), the rose locust (Robinia hispida), the rhododendron in its various forms, the ivy (Kalmia latifolia), and many others, confirming what Dr. Curtis has said, that "in all the elements which render forest scenery attractive, no portion of the United States presents them in happier combination, in greater perfection, or in larger extent than do the mountains of North Carolina;" and he might have said the same of the State at large, for no portion of it is deficient either in the number or variety of its species, or in the size and value of its trees.

In order to realize the extent to which this richness of forest development is concentrated within the area of this State, it is only necessary to call attention to the distribution of a few kinds which are dominant and characteristic. Of species found in the United States, east of the Rocky Mountains, there are Oaks 22, and 19 in N. C.; Pines 8, and 8 in N. C.; Spruces 5, and 4 in N C.; Elms 5, and 3 in N. C.; Maples 5, and all in N. C.; Walnuts 2, and both in

N. C.; Hickories 8, and 6 in N. C.; Magnolias 7, and 7 in N. C. As to the first and most important group of the list, attention is called to the fact that there are more species of oaks in North Carolina than in all the States north of us, and only one less than in all the Southern States east of the Mississippi.

Perhaps it would not be amiss here to state that North Carolina enjoys the peculiar distinction of being the only State in the Union that fills completely every blank in the returns, as sent out by the Department of Agriculture at Washington.

Of the 182 official galenical drugs of the U. S. Pharmacopœia, 94 are of foreign growth, and of the balance, indigenous to the United States, all but one are found in North Carolina.

Glancing over a price-list of one of the largest of our fluid extract manufacturers, comprising 328 varieties of drugs, foreign and domestic, I find that of the latter more than 90 per cent. are indigenous to North Carolina.

I think that I am within the bounds of truth when I say that the firm doing the largest business as herbalists in the world is in North Carolina. The amount of business done by them may be illustrated by the following extract taken from their order-book, covering one month's sales: 50,000 pounds Mandrake, 5,000 pounds Black Cohosh, 12,000 pounds Wild Cherry Bark, 8,000 pounds Red Clover Blossoms, 12,000 pounds Pennyroyal, 9,000 pounds Catnip, 8,000 pounds Stramonium leaves, 8,000 pounds Witch-hazel, 8,000 pounds Yellow Dock, 6,500 pounds Stillingia, 8,000 pounds Unicorn Root, etc.

They have taken a single order from one firm for as much as half a million pounds of drugs. Beginning in a small way some thirty years ago, this firm has gradually increased its business until they now employ more than three hundred agencies, and ship millions of pounds of drugs, consisting of more than 2,300 varieties. There are other smaller concerns in the State doing a less amount of business, confined to about one hundred varieties.

Ginseng is one of the most valued of the indigenous drugs of our State, commanding as much as $3 to $4 per pound. Therapeutically, it is of no value, except in the eyes of the Chinese, by whom it is greatly esteemed, and to whom it is all sent. Efforts to cultivate it have proved unremunerative; but so eager are the collectors to obtain it that it is frequently dug before the seeds are fully matured, necessitating the passage of a law by our Legislature preventing its collection before September.

Altogether, the shipment of indigenous drugs runs up into millions of pounds annually.

To my regret I have been unable to procure accurate information concerning the money value of the native drugs shipped from this State. The firms to which I applied either could not furnish it, or, for reasons best known to themselves, did not care to do so. I have therefore had to omit a reply to that part of the query, also to that part of it in regard to exports.

During the last two years of the "late unpleasantness," when the ports of the Southern States were blockaded, and medicines of all kinds were difficult, if not impossible, to be obtained, resort was had to our native materia medica, and well did it stand us in stead.

The climate of North Carolina is that happy mean between heat and cold, drought and moisture, arctic sterility and tropical exuberance, in which energies are stimulated by the bracing breath of a tempered atmosphere, cool enough to inspire physical activity, and warm enough to secure abundant returns to the tiller of the field whose labor is carried on under the happy conditions of a genial air, a friendly sun and a responsive soil.

In the sanitary department of the Census Reports it is stated that one or two of the three most healthful localities in the United States are found in the mountain regions of western North Carolina. There pulmonary consumption has never been known to originate. This feature has given the climate a celebrity for its remedial agency in such diseases, and has caused invalids to resort to the State from all parts of the Union, finding in many instances decided benefit or perfect cure.

It may be of interest to note that for spring the average temperature of the State is 57° F., for summer 77° F., for autumn 59° F., and for winter 41° F. Taking typical localities in each section as points of comparison, we find the mean annual temperature of Raleigh, in the middle section, to be 60° F., its summer temperature 76° F., and its winter temperature 44° F., while Florence, Italy, has respectively the temperatures: 59° F., 75° F. and 44° F. In the eastern section, Beaufort, on the coast, shows as the mean 62° F., 78° F. and 46° F., while Genoa, Italy, has 61° F., 75° F. and 47° F. In the mountain section, Asheville shows mean temperatures for the year, 54° F., 71° F. and 38° F., which may be compared with Venice, Italy, which has 55° F., 73° F. and 38° F.

Should one not be satisfied with the conditions of temperature mentioned, and wish to avoid frost, there is within the mountains of North Carolina a thermal belt in which frost is unknown.

This frostless area is found on both sides of the mountains. The most noted of such regions is on Tryon Mountain in Polk County, and so sharply defined are the lines of exemption that it stands out a horizontal belt of verdure between areas above and below of blasted flower and foliage. Within this exempted area fruits never fail, and though at the height of 1,500 to 2,000 feet above sea level, frost never appears.

I am indebted for many of the foregoing statements to the Hand Book of North Carolina, published by our Agricultural Experiment Station, also to the State Board of Agriculture for its courtesy in permitting me to exhibit to the Association a collection of native drugs comprising four hundred and twenty-five varieties, which formed the exhibit of Messrs. Wallace Brothers, of Statesville, N. C., at the Columbian Exposition at Chicago, and which was afterwards donated by them to the State.

My acknowledgments are also due to Prof. Gerald McCarthy, of the Botanical Division of the North Carolina Agricultural Experiment Station, for a copy of Dr. M. A. Curtis' catalogue of the indigenous and naturalized plants of the State—a very rare book, comprising nearly five thousand species; also for a copy of Wood & McCarthy's "Wilmington Flora," consisting of more than twelve hundred varieties.

I take the liberty of adding the following extract from a letter of Prof. McCarthy's, which may possibly interest some member of the Association, viz.: "If any of your confréres should read a practical paper on drug farming, as distinguished from mere gathering of wild spontaneous growth, I believe Director Battle would agree to try the most promising plants as experimental crops and publish the results."

My thanks are also due to Messrs. Wallace Brothers, of Statesville, N. C., and to the National Sumac and Herb Co., of Henderson, N. C., for assistance, by which I am enabled to present a partial list of native drugs handled by them.

The author here concludes his paper with a list of over six hundred plants offered by the above firms.

RÉSUMÉ OF THE REPORT OF THE COMMITTEE ON ADULTERATIONS TO THE OHIO STATE PHARMACEUTICAL ASSOCIATION.

By Prof. B. S. Young and J. D. Lisle, M.D.

Acida.—Samples of nearly all common acids were examined and were found to fulfill the official requirements of strength and purity.

Acidum Boricum.—The products of three prominent manufacturers were examined. They conformed in every particular to the demands of the Pharmacopœia.

Bismuthi Subcarbonas contained traces of chloride, alkali or alkaline earths and arsenic.

Cinchona.—The amount of alkaloids in the five samples assayed ranged from 1·5 per cent. to 5 per cent., with an average of 3·4 per cent. The lot that showed 5 per cent. of total alkaloids contained 1·6 per cent. of quinine.

Glycerinum, of which fourteen samples, representing all the leading brands, were subjected to examination, was found to be satisfactorily pure. The absence of arsenic was particularly established.

Iodoformum.—One sample of the crystals and two of the powdered article were tested. A sample of the latter yielded 0·08 per cent. of fixed impurities. The other products were entirely dissipated by heat. Water, shaken with the substances, remained tasteless, colorless and neutral, but contained iodide, as was shown by silver nitrate.

Jalapa.—11·5 per cent., 12·6 per cent. and 12·5 per cent. of resin was obtained from the three different lots estimated. One and a half per cent. of the yield from the first quality was soluble in ether. The resin from the other two samples was entirely soluble.

Oleum Lini.—A sample of this was found to be viscid, *opaque*, of *fishy* odor and neutral to litmus. On standing it threw down a white precipitate. Further examination showed it to be adulterated with paraffin and cottonseed oil.

Opium.—Assays by the U. S. P. method showed an average of 12·18 per cent. of morphine in the four samples treated. The results obtained ranged from 8·9 per cent. to 15·6 per cent.

Paraldehydum was found to be of very strongly acid reaction. Sulphuric and hydrochloric acids were not detected in either of the three products. Mixtures of 8 c.c. of each sample in an equal volume of alcohol, with phenolphthalein as an indicator required respect-

ively 4·15 c.c., 4 c.c. and 12·8 c.c. of normal potassium hydrate volumetric solution.

This excessive acidity was found to be due to acetic acid, resulting from the gradual decomposition of the paraldehyde through long standing and exposure to air. Foreign aldehydes were absent.

Potassii Bitartras.—The official requirements were met by the two samples investigated.

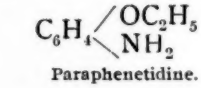
Spiritus Ætheris Nitrosi.—All four of the products assayed were acid. Three contained aldehyde. The preparations averaged a content of 1 per cent. of ethyl nitrite.

Zinci Oxidum.—Two of the three lots subjected to analysis possessed a slightly styptic taste, due to the presence of 0·7 per cent. and 0·27 per cent. of zinc sulphate. They showed 0 32 per cent., 1·16 per cent., and 0.257 per cent. of lead oxide. One contained carbonate. All were free from arsenic, cadmium, and silicate.

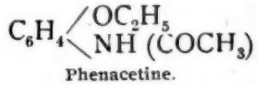
LACTOPHENINE.

According to a note in *Jour. de Pharm. et de Chim.* [5] **29**, 415, lactophenine is related to phenacetine as follows:

Phenacetine is an acetyl derivation of paraphenetidine.



Paraphenetidine.



Phenacetine.

Lactophenine is phenacetine in which the acetic residue is replaced by that of lactic acid; it is therefore a lactic residue of paraphenetidine; it is a white inodorous powder, soluble in 330 parts of water. Dr. Jaksch has employed it in abdominal typhus. This remedy is administered in doses of 5 to 15 grains. A total of 90 grains may be administered in the course of a day. In the smaller doses it acts as an analgesic, in larger doses as an hypnotic.

1,739,081 troy ounces of gold were produced in the United States in 1893, having a coining value of 35,950,000 dollars. The silver during the same period amounted to 60,500,000 troy ounces, with a coining value of 78,220,450 dollars.

EDITORIAL.

THE AMERICAN PHARMACEUTICAL ASSOCIATION.

A detailed report of the proceedings of this Association, which met at Asheville, N. C., September 3, 1894, will be found on another page.

The work of the Association may be considered under the following headings: (1) *General Sessions, including the President's Address;* (2) *Scientific Section;* (3) *Section on Legislation and Education;* (4) *Section on Commercial Interests.*

(1) *General Sessions.*—As usual, the President's address is a feature of the first meeting, and Professor Patch met the demand for something valuable and interesting from the executive head of the Association.

While we have nothing to say concerning the merits or demerits of his recommendations, yet is it not about time for this feature of the President's address to cease? It has grown to be a custom to have recommendations, and no President, in recent years, has had the independence to ignore this custom. The appointment of a committee to consider such recommendations always follows, and that committee usually finds itself in a difficult position, between fear of offending the President on one side and duty to the Association on the other. The result often is a non-committal report, which, after much discussion in the meeting, is so arranged as to "let the President down" without hurting his feelings. When reforms are so necessary as to be apparent, let the President suggest them; but, it usually being otherwise, he should not hunt for them. A brief review of the advancement in some department of science related to pharmacy would be of interest to most members, and give the President an opportunity to express his views.

(2) *The Scientific Section.*—The chairman of the Scientific Section did something of that kind this year by omitting the usual address, and it was to his credit. There were an unusually large number of papers contributed to this section (about fifty), a few only of which were of special merit. The great bulk of them were mediocre, and a number should be very carefully read by the committee on publication, and by them only, and not be allowed to appear in the Proceedings. A few years of natural selection with the survival of the fittest would exert a powerful influence in raising the value of the published Proceedings, and in adding interest to the meetings of this section.

(3) *Section on Legislation and Education.*—If the number of papers presented in the sessions of a section be an indication of its usefulness, then the meetings of this section ought to satisfy the most exacting critic. More than half a hundred papers were presented, but, owing to the liberality with which the discussion was conducted, comparatively few of them were read.

A large amount of the time was consumed in disposing of a resolution offered at Chicago last year by Prof. Hallberg. The negative report of the committee on that resolution, signed by S. A. D. Sheppard, Wm. Simon and C. M. Ford, is one of the most valuable documents which has been presented to the Association for a long time. The following quotation contains much concentrated good sense: "*The connection between the Association and the schools and colleges is one entirely of courtesy, and in no sense one of judicial authority.*" If the section had amended this so as to include *boards of pharmacy*, and then

remembered it, there might have been considerable time saved, instead of passing some similar resolutions this year.

To revert to the papers presented at the meetings of this section, it may be said that many of them were too lengthy to be read there; many more bear evidence of having been hastily "dashed off," and, as they were not read at the meeting, it is safe to predict that they will not be read except by the proof-reader, unless the before-mentioned committee on publication awakes to a sense of its duty. If ever there was an opportunity for a committee to do a creditable piece of work it is now offered to that body.

A very sensible plan was adopted by one or more members, who answered several or all of the queries proposed by the officers of this section, in one paper. Since some of the queries could best be answered by the words *yes* or *no*, and no labored argument could do more, this short method of disposing of them is to be commended. The section adjourned about midnight, after having exhausted itself over the question of what colleges of pharmacy should require of candidates for the degree of "Graduate in Pharmacy." Action was finally deferred until next year. It is hoped that in the meantime every member will read the report of the committee on Prof. Hallberg's resolution on a similar subject, which he offered at Chicago, and which they reported negatively at Asheville.

(4) *The Section on Commercial Interests* very properly took up the subject of alcohol taxation, and decided to submit recommendations to the Secretary of the Treasury, that no alcohol for internal use should be free from tax. This action may be a surprise to some, but it was shown that free alcohol for medicinal use would chiefly benefit the patent medicine manufacturer. If that be true, had not the Section better devote its energies to getting rid of the patent medicine manufacturer? He is becoming expensive. Then, too, we must ask, what has become of the amount of time and energy devoted by the Association in previous years to crying for free alcohol? We do not believe that free alcohol will drive any honest pharmacist out of the business, the dishonest ones should go anyhow.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

A Text Book of Practical Therapeutics; with special reference to the application of remedial measures to disease and their employment upon a rational basis.

By Hobart Amory Hare, M.D., B.Sc., Professor of Therapeutics and Materia Medica in the Jefferson Medical College of Philadelphia. Philadelphia: Lea Bros. & Co., 1894, 8vo. Pp. 740. Price, cloth, $3.75; leather, $4.75.

It is with pleasure that we call the attention of the profession to the fourth edition of this valuable work, all four editions of which have been issued within four years of its first publication. In addition, its merits have caused it to be introduced as a text book into a number of the most prominent colleges of the country. The book is written in a lucid and accurate manner, without the excessive use of technical terms, and much of it might be profitably perused by the pharmacist. Special attention is called to the article on "Acute Opium Poisoning," which, in the absence of a physician, the pharmacist is sometimes

called upon to treat. The condition of the patient is very accurately described, and the treatment from the personal knowledge of the writer is very effectual. Other articles of much general interest are those on Antiseptics, Cold and Heat as Remedies, and Foods for the Sick. Among the new remedies mentioned are Chloralose, Condurango, Convallarin, Duboisine, Pyoktanin (Methyl Blue), and Pyrogallol (Pyrogallic Acid). Pyoktanin is stated to be of some value in surgery of the eye, but valueless as an antiseptic in general surgery.

Several of the aniline dyes have been sold under this name, but it would be better, as the author has done, to confine the name to methyl violet. In view of the fact that many of the headache powders on the market consist mainly of Acetanilid, attention is called to the article on that subject, in which it is stated that in some cases alarming symptoms have been produced by moderate doses (3-10 grs.), and in two cases death from excessive dosage. C. B. L.

Chemistry, General, Medical and Pharmaceutical; including the chemistry of the U. S. Pharmacopœia.

By John Attfield, M.A., Ph.D., F.I.C., F.C.S., F.R.S., etc., Professor of Practical Chemistry in the Pharmaceutical Society of Great Britain. Fourteenth edition, specially revised by the author for America, to accord with the new U. S. Pharmacopœia. In one royal 12mo volume of 794 pages, with 88 illustrations. Philadelphia: Lea Bros. & Co., 1894.

The present edition corresponds to the concurrently produced fifteenth British edition. It is probably the first pharmaceutical chemistry to appear since the issue of the new Pharmacopœia, and will be especially welcome on that account.

The author has found it necessary to add much new matter, and wherever possible he has eliminated some of the old, in order to keep the book within the limits of a student's manual.

There is much to be commended in this work of Prof. Attfield. While the arrangement of the material is not all that could be desired, yet we believe there is no book on chemistry printed that contains so much valuable matter condensed into such small space.

The Journal. Published quarterly by the Alumni Association of the Cincinnati College of Pharmacy.

This new accession to the ranks of pharmaceutical journals is to be devoted to "Pharmacy, Botany, Microscopy, Materia Medica, Chemistry, and to Pharmaceutical Education and Progress."

The Journal Board of Managers are C. T. P. Fennel, Julius H. Eichberg and Theodore Wetterstroem.

The first number takes a high standard, and we trust that the succeeding ones will be able to maintain this standard.

AMERICAN PHARMACEUTICAL ASSOCIATION.

MEETING AT ASHEVILLE, N. C., SEPTEMBER 3-10, 1894.

General Sessions.—The first session was opened by an address of welcome by Mayor Patton, on behalf of the City of Asheville. This was replied to by Leo Eliel, the First Vice-President of the Association. The President, Edgar L. Patch, of Boston, then read his annual address.

He briefly reviewed the work of the association since its meeting in Chicago last year. The special Membership Committee, which he was directed to appoint had done good work.

Brief mention of the important events bearing on pharmacy, which have transpired since the last meeting was then made by the speaker. He touched on the rapid increase in new synthetic remedies, but left them to the careful sifting by the Reporter on the Progress of Pharmacy. The United States Pharmacopœia and the last volume of the Proceedings were then commented on. In reviewing the last meeting at Chicago, the president turned aside to briefly consider the criticisms made on American pharmacy by one of the English visitors, Mr. N. H. Martin. "We are quite aware," said Professor Patch, "that there is unlimited field for improvement in pharmacy here as in Great Britain, and are not surprised that our defects should be manifest to an interested and critical observer from abroad. Nevertheless it affords any of us, who have an active interest in pharmaceutical education, the deepest satisfaction to observe the great improvement in the quantity and quality of education offered to the American pharmacist, and to predict that our vantage ground is so well fortified and maintained that future progress must be more rapid." Following this are facts and figures which show that practical laboratory education is, in America, the rule and not the exception.

The difficulties which beset the pharmacist of to-day, and interfere with his making a bare living were then dwelt upon to considerable length.

The President recommended the publication and distribution by the Association of "An Observation Sheet." This consisted of heading concerning incompatibilities, processes of manufacture, etc., with blank spaces to be filled by the pharmacist giving the results of his observations.

He further recommended establishing an American Pharmaceutical Association Scholarship Fund of $1,500 annually, for the purpose of securing to suitable candidates the advantages of higher education in pharmacy.

Finally, brief allusion was made to recent publications of pharmaceutical works, and to some to be issued.

It is sufficient to say of the suggestion in regard to a scholarship, that the Association did not see its way clear to adopt it.

Various reports from the committees were next read by title and laid upon the table. The reports of delegates were received. The Secretary of the council, Geo. W. Kennedy, reported that suitable resolutions, regarding our late Permanent Secretary, Prof. John M. Maisch, had been engrossed and contained the signatures of the members of the council, and were sent to the family of Professor Maisch. The Committee on Prize Essays (Professor Good, Chairman), reported that the first prize had been awarded to Chas. Caspari, Jr., and A. R. L. Dohme, for their paper on "The Value of Titration with Volumetric Acid Solution as a Means of Assaying Alkaloidal Drugs and Galenical Preparations." The second prize was awarded to Henry Trimble and J. C. Peacock, for their joint paper "On the Preparation of Oak Tannins, with Special Reference to the Use of Acetone as a Solvent." Both of these papers were printed in the Proceedings for 1893.

The finances of the Association are sound, but the Chairman of the Finance Committee, in conjunction with the Treasurer, cautioned the members of the different committees to be more considerate of their expenses. The use of the

initials "A. P. A." was discouraged for use on stationery, etc., and only sanctioned on the gold badges. There were various changes in the by-laws so as to make them conform to the resolutions adopted at Chicago. A resolution was passed compelling members dropped from the roll to pay the sum of $15 before reinstatement to membership in the Association. Total membership at the time of the present meeting, 1,524. Honorary members, 18. New members proposed at meeting, 171. A Nominating Committee, to elect the officers for the ensuing year, was appointed, and the Association adjourned.

General Sessions.—Tuesday, September 4, 9 A.M. The report of the nominating committee was received and the candidates for the respective positions elected by the Association. The officers for the ensuing year are: President, William Simpson, Raleigh, N. C.; First Vice-President, Charles M. Ford, Denver, Col.; Second Vice-President, John N. Hurty, Indianapolis, Ind.; Third Vice-President, Joseph E. Morrison, Montreal, Quebec, Can.; Treasurer, Samuel A. D. Sheppard, Boston, Mass.; Permanent Secretary, Charles Caspari, Jr., Baltimore, Md.; Reporter on the Progress of Pharmacy, Henry Kraemer, New York. For membership of Council the following: W. S. Thompson, H. M. Whelpley, S. P. Watson and G. W. Voss. One hundred and seventy-one applications for memberships were proposed. These were, upon the vote of the Association, invited to complete their membership after their names had been posted in a conspicuous place. Report of committee on place of next meeting decided upon Denver, Col. This was unanimously adopted by the Association. Reports of the various committees were read. Credentials from nearly all of the States of the United States were received. Prof. C. Lewis Diehl made an extensive report of the work performed by the Committee on National Formulary. The defects in formulas at present incorporated therein were few and easily remedied. The number of desirable additions are small. A number of changes were read to make it conform to the U. S. Pharmacopœia, and wherever practicable, as in the case of Elixir Aromaticum, the U. S. P. initials will follow thereafter. Mucilage of acacia was directed to be used instead of the mucilage of Irish moss. Some corrections were made in the following preparations of N. F.: Elixir Chloroformi Comp.; Elixir Cinchonæ is to be made from the alkaloids; Elixir Bismuthi is to contain only citrate of bismuth and ammonia. Mistura Chloroformi et Opii was improved upon, and the general directions for making tablet triturates incorporated. In the manufacture of hypodermic tablets, cane sugar is to be employed as a basis. Elixir Paraldehydi is to be increased to 20 per cent. Improvements are also made in preparing Liq. Magnesii Citratis, Syr. Codeinæ Sulph. and Elix. Rhamni Purshianæ Arom. An epitome of the N. F. was also recommended to be prepared for the use of the physician. Professor Diehl also related a plan devised by the Kentucky Pharmaceutical Association for making the National Formulary a popular work among pharmacists. It consisted in having members prepare preparations in strict accordance with the N. F. and submit them at the annual meeting for the inspection of the members and others. About seventy members made preparations in this manner, and these elicited more attention than anything else when presented at the meeting of the Medical Association. It is suggested that this method might, with great value, be adopted by other State associations. Some of the samples submitted by the chairman at the American

Pharmaceutical Association meeting were of: Sal Carolinum Factitium (N. F. for Artificial Effervescing Carlsbad Salts), Elixir Ferri Phosphatis, Quininæ et Strychninæ, Elixir Gentianæ containing Tinct. Ferri Chloridi, Ext. Stillingiæ Fld. Comp., Elixir Bismuthi and Syr. Acidi Hydriodici Decolor. (colorless syrup of hydriodic acid).

In the report from the chairman of the American Pharmaceutical Association delegates to the San Francisco meeting of the American Medical Association, it was stated that one paper read by a physician claimed that more harm had been done by physicians dispensing than by the pharmacists furnishing medicines. The chairman of delegates to Pan-American Congress reported that the section of pharmacology had made a most favorable impression by reason of the number and character of papers presented to this Congress. The resolutions proposed by the Committee on the U. S. Pharmacopœia (H. M. Whelpley, Chairman) were adopted, viz.: Approval of the changes and character of the recent edition of the U. S. Pharmacopœia. That a table of maximum doses of energetic drugs be given in the U. S. Pharmacopœia. That as the recipe file is the only indication of the kind of medicines employed in the United States, it was suggested that the committee of revision of the U. S. Pharmacopœia obtain the co-operation of the State Associations in securing information concerning the ingredients entering into the recipes of the respective collaborators. It was furthermore moved that the American Pharmaceutical Association appropriate means if necessary to assist the work of the committee. A. E. Ebert presented a report of the work of the International Pharmaceutical Congress.

Final General Session.—Saturday, September 8th, 10 A.M., Prof. Oscar Oldberg, Chairman of the International Pharmaceutical Congress, informed the Council of the status of the publication of their proceedings. It was "Resolved that the balance of the appropriation of $1,000 in favor of the International Pharmaceutical Congress be used to publish the Proceedings of the International Pharmaceutical Congress, and it was further resolved that the actual transactions of the Congress, such as votes passed and resolutions adopted touching important general principles be published in the German, French and Spanish languages, as well as English, but that the minutes of the Congress be published in English only. A special committee, consisting of S. A. D. Sheppard, J. P. Remington and O. Oldberg, was appointed with the power to determine how the money should be expended for said publication, and to decide upon distribution of the same. C. Caspari, Jr., moved "That the Council of the American Pharmaceutical Association tender to Joseph P. Remington the sincere appreciation of his efforts in the careful and thorough manner in which he has performed the duties of the office of Permanent Secretary *ad interim*. The transfer of the office, without an opportunity of consulting the late Prof. John M. Maisch, as to facts and methods, carried with it a vast amount of intricate work and labor which has been most satisfactorily executed by Prof. Remington. The council desires to place on record its sense of gratitude to Prof. Remington for his valuable services." This, by a rising vote, was unanimously adopted by the Association.

A motion was made by H. M. Whitney, and carried, to the effect that the American Pharmaceutical Association condemns the supplying of medicines to the physician by manufacturing houses for the use of putting up his own

prescriptions and that all dealings with such houses by members be discountenanced.

The Committee on President's Address recommended the adoption of the observation sheet proposed by Prof. E. L. Patch, and that the chairman of the section on scientific papers be instructed to have 5,000 forms printed for distribution and a report thereupon to be read at the next annual meeting. Regarding the question of a "Pharmaceutical Fellowship" to be established by the Association, while recognizing the value thereof, yet the Association was considered not to be in a financial position to take action thereupon at this time. Report of Committee on Centennial Fund, the chairman announced that $50 had been appropriated during the past year for the use of Prof. E Kremers, Madison, Wis., for prosecution of his work on Menthol.

SECTION ON SCIENTIFIC PAPERS.

Chairman L. E. Sayre called the meeting to order on Wednesday evening, September 5th, at 9 o'clock. He presented a large (two feet long) specimen of the root of *Cucurbita perennis* (man-in-the-earth), which was obtained in Western Kansas, and said to contain a bitter principle. A chemical analysis would be made during the forthcoming year. Paper on *Rhus toxicodendron* was read by H. M. Whelpley. The question was, whether the poisonous constituent was destroyed by drying. It is not wholly destroyed. Out of 36,000 recipes examined by A. E. Ebert, but five called for Rhus toxicodendron. Thirty-four remedies for Rhus poisoning are to be found in medical works.

Discussion: Dr. Bartley stated that he had been poisoned by the dried plant in winter. J. U. Lloyd stated that different people were differently affected, and told of a lady who was poisoned by simply being in the room when bottles were being filled with the tincture. She was never poisoned by the dried *Rhus toxicodendron*.

A further discussion upon the paper revealed but little that was new. Prof. Patch said that a preparation of Resorcin, Glycerin and Gelatin applied locally every six hours, proved to be exceedingly efficacious in thirty-six hours, in the case of a man severely laid up for several days. Constitutional treatment, however, seems to be necessary after the poison enters the circulation.

Examination of Kola.—C. O. Topping. Six samples of kola were examined for total alkaloids, for separate alkaloids (caffeine and theobromine), also for tannin. Three methods for estimating total alkaloids were employed, viz.: (1) Heckel's; (2) Squibbs; (3) Modified Prollius. Lowenthal's method of estimating tannin was adopted. The author also performed experiments to prove indirectly the presence of a ferment in kola which, acting upon a glucoside "kolanin" under suitable conditions of heat and moisture, produces *caffeine*, *glucose* and *kola red*. The paper is accompanied by a tabulated statement of the results obtained.

Reduced Iron (the quality dispensed by pharmacists).—G. C. Stevenson. The work confines itself mainly to the per cent. of metallic iron in the free and uncombined state, the per cent. of insoluble residue, together with the question of impurities within specified limits. Of ten samples analyzed, only three were equal to or above the standard (80 per cent.) for uncombined iron as required by the Pharmacopœia. The remainder were from 16 to 60 per cent. below standard, while two contained from 2 to 5 per cent. less of total iron than that

required of the free uncombined iron. "From these analyses it appears that the preparation is of a very inferior quality, and presents an item which should not be treated lightly by pharmacists." A tabulated statement of results accompanied the paper.

White Castile Soaps.—Samuel R. Knox discussed the materials from which soap is made. The analyses include:

(1) Estimation of water.

(2) Estimation of unsaponified matter.

(3) Estimation of the relative proportions of fatty acid and alkali.

The author concludes that white castile soap of the market is highly adulterated with other oils. Tabulated results of the analyses of eight samples of white castile soap follow.

A Microscopical Study of Cicuta Maculata.—F. Lyle Robertson has investigated the structure of the root. The paper is illustrated by seven drawings.

Glycerin of the Market.—J. L. Tegarden examined thirteen samples of all grades and brands and has tabulated the results as follows:

Specific gravity, dextrose and sugar, fixed impurities, acids, salts (calcium), chlorides, arsenic.

Experimental Work on the Solvent Power of Alcoholic Menstrua.—L. D. Havenhill. "The laboratory notes on 'The Variation of Menstrua in Fluid Extracts,' by Prof. E. L. Patch, appended a suggestion that we might enter upon an interesting and beneficial line of experiments to determine the menstrua best adapted for obtaining the active principles of drugs free from their inert extractives. Accordingly, a series of experiments were made on ten of the most potent medicinal drugs, using menstrua of varying proportions of alcohol and water." "No general relation was found to exist between the per cent. of extractive and the per cent. of alkaloids." The author concludes: "It was very gratifying to note that the menstrua directed by the present Pharmacopœia were, in nearly every instance, the ones best fitted for extracting the active principles of the drugs on which the experiments were made." Three very complete and valuable tables accompany the work.

Notes on the Behavior of Albuminate of Iron and Ferratin with Artificial Gastric Juice.—J. O. Schlotterbeck and S. R. Boyce. In a recent paper read before the Cincinnati Academy of Medicine, by Dr. G. A. Fackler, the following advantages of ferratin over all other artificial albuminates of iron are claimed:

(1) In ferratin we have a compound which, because of the fact that it is not altered in the stomach or intestinal tract, is wholly absorbed and made available.

(2) Ferratin, due to the intimate union between it (iron) and the albumin, is so slowly attacked by the sulphuretted hydrogen, that it is absorbed before an alteration into the sulphide can occur.

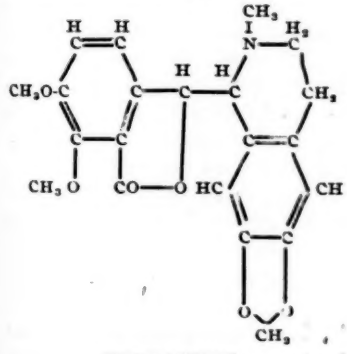
(3) Since, as a rule, the food which we ingest has been subjected to heat during the process of its preparation, and since in the above process (that of separating the natural iron compound from pig's liver) no other force but heat has been employed, we undoubtedly secure in this compound that form of iron which enters the stomach with animal food, and which is, in part, absorbed and deposited in the various organs.

The results of analyses of albuminate of iron and ferratin, as made by the authors, are given below:

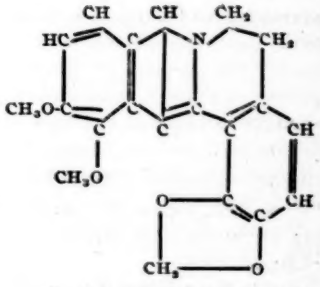
Albuminate of Iron.	*Ferratin.*
Pale red powder.	Dark brown powder.
Iron 2·1 per cent.	Iron 5·4 per cent.
Insoluble in water.	Insoluble in water.
Soluble in dilute alkalies.	Soluble in dilute alkalies.
Soluble in dilute acids.	Soluble in dilute acids.
With $(NH_4)_2$ S begins to blacken in 5 seconds.	Begins to blacken in 20 seconds with $(NH_4)_2$ S.
Pepsin and HCl convert 43 per cent. of the iron into ferrous and ferric chloride by one digestion.	Pepsin and HCl convert 37 per cent. of the iron into ferrous and ferric chloride by one digestion.
By removing the peptones, etc., and subjecting to second digestion, 42 per cent. more of the iron is converted into the inorganic form, or a total of 85 per cent. of the original iron.	By subjecting to same operation, 43 per cent. more of the iron is converted into the inorganic form, or a total of 80 per cent. of the original iron.

The author claimed that Ferratin possesses no great advantages over ordinary albuminate of iron.

Queries 14 and 15.—The relation of hydrastine and berberine to one another, and their mode of combination in the drug. To illustrate the relation of the two alkaloids, Alfred R. L. Dohme referred to the following graphic formulas constructed by Freund:



HYDRASTINE.



BERBERINE.

Being unable to find an acid in hydrastis, which yields the alkaloids as such to cold ether and benzene, the author concludes that these principles exist in the free state.

Discussion.—Dr. Greve suggested that the white alkaloid was made known first in this country, and the yellow alkaloid shortly afterwards in Europe.

J. U. Lloyd remarked that Rafinesque, in 1828, called it hydrastine and suggested that there arose a misunderstanding of the word. The white hydrastine of those days became known later as the yellow berberina.

Dr. Dohme, in explanation, suggested that neither was pure, and that such a statement as one being superseded by the other, referred only to the name;

as the impure white alkaloid, *hydrastina*, became known, the impure yellow alkaloid, *berberina* was shown to be also present, and an active principle. The result was that people generally adopted the name berberina for the alkaloid of hydrastis, substituting it for hydrastina.

J. U. Lloyd desired to know if the experiments were made with dry or fresh hydrastis, as drying might result in an alteration of the construction of the constituents.

Dr. Dohme replied that he employed the dried drug, but that he hoped to experiment with the fresh drug before the next meeting.

C. S. N. Hallberg wished to ask Dr. Eccles why hydrastinine was inserted into the U. S. P. and not hydrastine.

Dr. Eccles replied that both were intended to be inserted and that both were employed in Brooklyn and New York, and that hydrastinine was found to be more efficacious and used in smaller doses.

Dr. Dohme showed that hydrastinine was a decomposition product of hydrastine, just as cotarnine was the same of narcotine, as follows :

$$\underset{\text{Hydrastine.}}{C_{21}H_{21}NO_6} + O + H_2O = \underset{\text{Hydrastinine.}}{C_{11}H_{13}NO_3} + \underset{\text{Opianic acid.}}{C_{10}H_{10}O_5}$$

$$\underset{\text{Narcotine.}}{C_{22}H_{23}NO_7} + O + H_2O = \underset{\text{Cotarnine.}}{C_{12}H_{15}NO_4} + \underset{\text{Opianic acid.}}{C_{10}H_{10}O_5}$$

Chas. Caspari, Jr., exhibited a new suppository mould.

Powdered Extracts.—C. S. N. Hallberg has made a full series of extractions with alcohol, methyl alcohol and a mixture of alcohol and chloroform in varying proportions. The best results were obtained by the use of a mixture of alcohol 75 cubic centimetres and chloroform 25 cubic centimetres. The percentages of extracts obtained ranged from 6 per cent. to 15 per cent. In every case, the extract, when mixed with sufficient milk sugar to make one-fourth the weight of the drug, furnished a nice-appearing, homogeneous powdered extract, which, from present indications and from the comparatively small percentage of extracts contained in them, will retain the pulverized condition, with ordinary care, for any reasonable length of time. The author suggests that this class of preparations replace the abstracts, and suggests the term "quatract" (already proposed by the author, Proc. xxxvi., page 105) as a synonym. This would tend to draw attention to the strength of the preparation.

Laboratory Notes, a contribution by Prof. E. L. Patch, treated of the quality of hydrogen dioxide, carbolic acid and reduced iron.

Of thirty samples of commercial hydrogen dioxide examined, about one-half were standard as regards the U. S. P. requirement for available oxygen. All were too strongly acid to be official. Ten samples for medical use were found to be of fair quality.

Carefully conducted experiments with the official process yielded the contributor good products.

To test the assertion that best results are gotten from a concentrated solution obtained by evaporating the official solution to one-third its volume, a series of experiments were made, the results of which showed that by this means a stronger solution could be obtained, but not without loss of oxygen,

which sometimes amounted to one-third of what the concentrated solution should represent. Attention was directed to the occurrence of water in high-grade carbolic acid which was sold as official. Lowered fusing and boiling points were mentioned as indications of its presence.

Examination of ten samples of reduced iron, including both gray and black, showed considerable variation. None contained sufficient metallic iron to be official, although several were so labelled.

Additional experiments with Datura Stramonium were contributed by Alfred R. L. Dohme, who drew the following conclusions:

(1) That the stems of *Datura stramonium* contain more alkaloid than the leaves.

(2) That the plant *Datura stramonium* gathered in June contains less alkaloid than that gathered in July and August.

(3) That Keller's method extracts more alkaloid from the drug than Dragendorff's method does.

This gentleman also submitted a discourse on *the relative alkaloidal value of two kinds of ipecac root*, known as "fancy" and "wiry." The former is the annulated variety and is the root proper, while the latter is that part of the root which merges into the stem. In a given weight, the "wiry" shows more cortex, which, being the seat of the alkaloid, makes this variety richer in emetine than the "fancy."

In another paper the same author answered the query: *What is the quality of the reduced iron dispensed by pharmacists?*

After examining numerous samples of both black and gray, the latter of which usually contains the larger amount of metallic iron, he reported that the article usually sold is not of standard quality on account of the presence of considerable oxide and sulphide.

The following table gives representative compositions expressed in percentages:

Product.	Inorganic residue insol. in hydrochloric acid.	Organic residue, insol. in hydrochloric acid.	Total iron, determined as ferric oxide.	Iron combined as sulphide, determined as sulphate and calculated as ferrous sulphide.	Uncombined iron, determined by the U. S. P. method.	Iron combined as oxide, difference between total iron and the sum of free and combined as sulphide.	Shortage regarded as carbon lost as carburetted hydrogen in dissolving the iron.
R	0·4	0·5	98·5	0·00	83·0	15·5	0·6
W	1·17	1 81	82·2	9·3	47 0	25·9	14·82
I	1·63	1·23	97 8	2·1	92·0	3·7	0·00
B	1 65	1·0	85·8	18·8	35·0	32·0	11·55
S	1·67	1 58	96·0	8·27	68·0	19·73	0·75

Improved working formula, number 27, National Formulary, was the subject of a paper by Samuel C. Davis, who has found the following method satisfactory for the preparation of Elixir of Valerianate of Ammonium.

Add 3 fluidrachms water of ammonia U. S. P. to 5 fluidrachms of water, and in this dissolve 256 grains ammonium valerianate, which solution is now added to 12 fluidounces of aromatic elixir; then add chloroform, tincture of vanilla, and compound tincture of cudbear (in quantities as per N. F.), and agitate; now add q. s. aromatic elixir to make 16 fluidounces.

A method for the estimation of mono- and bicarbonate of sodium in commercial bicarbonate of sodium was submitted by Prof. W. T. Wenzell. After the estimation of the mixed carbonates, the amount of each is ascertained by a carbon dioxide determination simply—the process being based on the following data:

(1) The percentage amount of carbon dioxide contained in sodium bicarbonate = 52·38095.

(2) The percentage amount of carbon dioxide contained in sodium monocarbonate = 41·50943.

(3) The difference between the two percentage amounts of the two carbonates, 52·38095 — 41·50943 = 10·87152.

(4) A factor representing 1 per cent. of this difference, 10·87152 ÷ 100 = ·1087152.

From the foregoing amounts the following data have been proposed for formulating the analytical process:

A. = Percentage amount of CO_2 obtained by the actual analysis of the sample.

B. = Theoretical percentage of CO_2 contained in the sample, calculated as $NaHCO_3$.

C. = The difference between the respective amounts of A and B.

D. = The factor representing 1 per cent. of the difference of the amounts of CO_2 contained respectively in $NaCO_3$ and $NaHCO_3$.

E. = The percentage amount of Na_2CO_3.

F. = The percentage amount of $NaHCO_3$.

G. = The total percentage amount of mixed carbonates in the sample.

FORMULA.

A. — B. = C.
C ÷ D. = E. (E. = Na_2CO_3.)
E. — G. = F. (F. = $NaHCO_3$.)

Analytical Alkaloidal Chemistry.—Lyman F. Kebler, after reviewing the development of the various methods of extracting, separating and estimating these principles, discussed *the relative value of gravimetric methods, Mayer's reagent and tritration with volumetric acid solutions in assaying alkaloidal drugs and galenical preparations.*

A table of the results of the three methods is given for the more frequently used alkaloidal drugs, an examination of which shows the mean percentage results obtained by the use of volumetric acid to be in most cases about ten per cent. lower than those from the gravimetric method. Uniform success was not had by use of Mayer's reagent.

The adoption of a certain method, both for the extraction of the alkaloid and the titration with a volumetric acid solution, is recommended to insure uniform results with every drug.

Under the title of *Alligation in pharmaceutical calculations—its usefulness and limitations*, Prof. T. D. Reed treated of this arithmetical principle to which the introduction of standardized drugs has directed some attention. The limitations of its applications under certain conditions were demonstrated by problems.

The official process for spirit of nitrous ether was discussed in a paper by Chas. M. Ford, in whose hands it was neither satisfactory nor economical. Some modifications and suggestions of practical value were offered to make the process more feasible.

Supplementary to a paper read at the meeting of the Association in 1893, Prof. L. E. Sayre presented *Further notes on taraxacum root*, recording the difference between the drug collected from *upland* and that gathered in *lowland*. The analysis of fresh root, and of the same after being dried at 50° C., showed practically no change in the amount of taraxacin, resin and reducing sugar.

Incineration of the well-dried crude inulin, which is precipitated when a concentrated aqueous extract of taraxacum is mixed with alcohol, showed 91 per cent. of organic matter; while boiling with dilute hydrochloric acid and treatment with Fehling's solution indicated 79·02 per cent. of inulin.

J. B. Nagelvoort, in a paper detailing the preliminary preparation of the material to be examined and the plan of applying the solvent, recommended *The use of isobutylic alcohol for the detection of morphine and codeine* in pharmaceutical preparations and patent medicines, as preferable to amylic alcohol, which is so diagreeable to handle. The solution of the material to be examined is made alkaline with ammonium hydrate, and agitated with successive portions of isobutylic alcohol, which is separated and evaporated.

The same author, in another contribution, *The testing of arsenic of the U. S. P.*, pointed out the mistakes that might occur from following the directions given by the Pharmacopœia, to use tin-foil in applying Bettendorf's reaction for the detection of arsenic in tartar emetic. The black precipitate of metallic antimony produced would obscure any reaction that might be due to arsenic.

The author states the reaction to be reliable if the tinfoil is omitted.

Quantitative determination of some substances in aqueous solution by means of the refractometer was treated of at length by W. F. Edwards. The method of taking the readings was as follows: The glass-stoppered flasks containing the solutions were placed in a tray, through which water circulated from the hydrant in the room. The prism of the refractometer was also placed in the tray. After the water from the hydrant became constant in temperature, and the temperature of the prism and solutions had become the same as that of the water, the prism was taken out, hastily wiped dry and placed on the instrument, with some of the solution to be investigated. The reading was taken as quickly as possible, and the prism again placed in the tray. This was again taken out and, as before, quickly wiped dry and another solution used. The time required for taking a reading after the solution was taken from the tray was probably not more than ten seconds. The duplicate readings did not vary much. The substances determined were hydrochloric, acetic, sulphuric

and nitric acids, ammonia and alcohol. Titration and specific gravity were employed to furnish solutions of definite strengths. The indices of refraction for sodium light of the substances in the different dilutions are given in tables for comparison with the specific gravities and per cent. content.

In some instances the increase in the number that represents the index of refraction was quite regular for each per cent. of increase of the substance in solution; in others it becomes less uniform the higher the percentage runs. Tables have been calculated from the average increase and give the per cent. of content in whole numbers, compared with the index of refraction.

When the differences in the latter, for a difference of 1 per cent. in content, are too small and variable to be of practical use—as is experienced in the estimation of nitric acid, above 60 per cent.; acetic acid, above 60 per cent.; and sulphuric acid, above 80 per cent.—it becomes necessary to take the reading on the refractometer, as usual, then add to the substance from one-fifth to one volume of water, and take the reading again at the same temperature. The dilution must be adjusted low enough to admit of reading on the instrument and reference to the table. In the determination of alcohol, when the index 1·36000 (which indicates about 40 per cent. content) is exceeded, considerable variation occurs.

A paper on *Hydrocymenes and Derivatives*, by Prof. Edward Kremers, treated of the constituents of volatile oils, many of which may be considered as derived, directly or indirectly, from *i cymene*, $C_{10}H_{14}$, a hydrocarbon which occurs in a number of these oils, such, for instance, as those of thyme and *Cicuta virosa*.

A synopsis of the new nomenclature as applied by Baeyer to the older names and of the number of possible isomers may be stated as follows:

Hydrocarbons.—Terpane, Hexahydrocymene, $C_{10}H_{20}$. Of this we have only one structure.

Terpenes, Tetrahydrocymenes, $C_{10}H_{18}$. Six are possible.

The two known are carvomenthene and menthene.

Terpadienes, Dihydrocymenes, $C_{10}H_{16}$. Fourteen structures can be formed for this class.

Pinene and camphene are placed in a separate group by Baeyer.

Alcohols.—Terpanols, Hydroxyhexahydrocymenes, $C_{10}H_{19}OH$. Seven isomers are possible. Terpan-3-ol is ordinary menthol.

Terpenols, Hydroxytetrahydrocymenes, $C_{10}H_{17}OH$. Of these there are forty-three isomers possible.

The terpineols belong to this group.

Terpadienols, Hydroxydihydrocymenes, $C_{10}H_{15}OH$.

Eighty-seven structures can be produced to represent their constitutions.

Terpadiols, Dihydroxyhexahydrocymenes, $C_{10}H_{20}O_2$.

Twenty-four diatomic alcohols of this class are possible. Terpin is the representative.

Ketones.—Terpanones, Ketohexahydrocymenes, $C_{10}H_{18}O$.

Of these there are but two, carvomenthone being the α-ketone and menthone the β-ketone.

Terpenones, ketotetrahydrocymenes, $C_{10}H_{16}O$.

Eleven α-ketones of this type are possible and an equal number of β-ketones.

Dihydrocarvone is representative of the former class and pulegone of the latter.

Terpadienones, ketodihydrocymenes, $C_{10}H_{14}O$.

There are possible fourteen α-ketones and fourteen β-ketones of this class. Carvol, envarcol and isocarvol are members of this group.

Phenols, $C_{10}H_{13}OH$. Carvacrol and thymol are these.

The above review shows the complexity of the cases of isomerism to be expected from this class of bodies. The author recommended some such system of nomenclature as that recently suggested by Baeyer.

The contribution also embodied some original work with the derivatives of menthol by means of which the secondary alcohol group was shown to be in ortho position to the carbon atom in connection with the propyl group.

Do the so-called elegant preparations of cod-liver oil, from which the oil has been removed, possess any therapeutic value? Henry A. Stearns and. F. E. Stewart each submitted a paper intended to answer this query.

The paper on *Examination of preparations of cod-liver oil for alkaloids of cod-liver oil*, by J. O. Schlotterbeck, possibly belongs with the two above-mentioned contributions, but, as it was not printed in time for the meeting, we have been unable to obtain a copy.

Officers of this section:

Chairman, A. R. L. Dohme, Baltimore, Md.

Secretary, Geo. B. Kauffman, Columbus, O.

Associate, to be selected by these two.

SECTION ON EDUCATION AND LEGISLATION.

First Session Friday, September 7, 1894, 10 A. M.—The chairman, R. G. Eccles, delivered his annual address, which was moved to be referred to the Publication Committee, and that a committee of three be appointed to consider the recommendations contained therein.

REPORT OF COMMITTEE ON RESOLUTION OFFERED BY PROF. C. S. N. HALLBERG, AT CHICAGO, AUGUST 17, 1893.

"At the meeting of the Section on Pharmaceutical Education and Legislation in Chicago last year, the undersigned were appointed a committee to consider and report on the following resolution:

'*Resolved*, That the following conditions shall determine what constitutes recognized Colleges of Pharmacy, that is, the requirements for graduation are: (1) Age, 21 years; (2) Experience in pharmacy four years, including time at college; (3) Two courses of at least six months each, extending over more than one year.' See 1893 Proceedings, page 277.

"As soon as the Committee began to consider carefully the character and full scope of this resolution, they realized that action upon it might be very far-reaching in its effects, upon both the American Pharmaceutical Association and the Pharmaceutical Schools of the country.

"They therefore requested that they might have a year in which to consider the matter before making their report. And now that they are about to present that report, they confess to a feeling of deeper anxiety concerning the matter

than they did a year ago, and they urge the Association to be very careful in its action on the subject.

"While many of us have very strong convictions in regard to the matters referred to in this resolution, we must, for the moment, allow these convictions to remain unexpressed, and strive to answer the following, which is the only real question now before us: What position should the American Pharmaceutical Association take in regard to Prof. Hallberg's resolution?

"The connection between the Association and the schools and colleges is one entirely of courtesy, and in no sense, one of judicial authority. Nevertheless, the connection is a very strong one, and the Association on the one side, or the schools on the other, can, very materially, help or retard the good work that all are doing in the cause of pharmaceutical education. Now, what action can the Association take on this subject that will give the most help to pharmaceutical education, as represented in this country to-day? It would seem to be for the best that the Association should be a common meeting-ground for all; that there should be, at all times, on this common meeting-ground, such full and friendly discussion of methods as shall stimulate, benefit and teach, without producing friction or bitterness of feeling.

"It is very plain that the Association has no judicial rights to exercise. While most of the active workers in the schools are members of the Association, they are members simply in their personal capacities, and not by virtue of their connection with their schools. Nor, can it be said that the Association is an association of schools. It is simply a body made up of individual members. Therefore, it would seem that the American Pharmaceutical Association has no right to set itself up as a judge of what should be considered a regular, or recognized, or reputable, or good or bad, college of pharmacy. Should the colleges and schools of the country, acting in concert, present the question to the Association for answer, then we might, very properly, take a decided position in regard to it. But for us voluntarily to pass a resolution of such a strong and positive character, censuring the course pursued by pharmaceutical schools standing high in the work of pharmacy, would, in the judgment of your Committee, be very doubtful policy.

"The Committee, however, believe that the position of the Association is such that resolutions of a suggestive or advisory character, if passed by a two-thirds or three-fourths vote, may be of great help to the various schools, because such resolutions would probably express the prevailing opinions of the majority of the best men engaged in our line of work in this country, and the American Pharmaceutical Association is, practically, the only medium through which such information can be obtained.

"Your Committee, therefore, recommend that the resolution offered by Prof. Hallberg be not adopted.

"They also recommend that the Association adopt one of the following resolutions, provided that three-fourths of all the votes cast shall be in the affirmative:

FIRST RESOLUTION.

"*Resolved*, That it is the sense of the American Pharmaceutical Association that the cause of pharmaceutical education would be advanced, should all pharmaceutical schools that confer the degree of graduate in pharmacy, adopt the following suggestions:

(1) That the standard for admission to the school shall be not less than that required for admission to the public high schools of the country.

(2) That each student shall attend not less than two (2) courses of lectures, each course extending over a period of not less than twenty-two (22) weeks, the student to be in attendance upon not less than six (6) lectures in each week, and not less than one hundred and fifty (150) lectures in each session. That these lectures embrace those upon Pharmacy, Chemistry and Materia Medica, but do not include lectures upon Microscopy, Botany, Latin and other useful branches. That not less than one hundred and fifty (150) hours of practical work, and more, if practicable, should be required of each student, to be apportioned throughout the various courses as may seem best.

(3) That every student, in order to graduate, should be familiar with all the teachings of the Pharmacopœia, and fully capable of performing all operations mentioned in it.

(4) That the course of study shall not be forced, but shall be such as to allow for the proper digestion and assimilation of the instruction given in the school.

(5) That, as far as practicable, students shall give their whole time to college work during the sessions of the school, and not divide their time between work in a store and work at college. That no student shall be retained at school whose outside duties will not permit him to do full justice to his studies or to the laboratory work assigned him.

(6) That the degree shall not be conferred upon any person who is less than twenty (20) years of age at the time of completing his final course at school.

(7) That the degree shall not be conferred upon any person who has had less than three (3) years' practical experience in a good drug store, where physicians' prescriptions are compounded, exclusive of the time spent at college.

SECOND RESOLUTION.

"*Resolved*, That a Committee be appointed, consisting of one representative from each of the colleges and schools of pharmacy of this country, represented by members in this society, with three members of the Association, neither of whom are teachers in any pharmaceutical college or school. The duty of said Committee shall be to take into careful consideration the condition of pharmaceutical education in this country, make recommendations relative thereto, and report to the Association at its next annual meeting."

S. A. D. SHEPPARD,
WILLIAM SIMON,
CHAS. M. FORD,
Committee.

After considerable discussion by S. A. D. Sheppard, Wm. Simon, C. M. Ford, C. S. N. Hallberg, O. Oldberg, L. E. Sayre, the second resolution was adopted as recorded—the words "represented by members in this society," to follow the words "of this country."

Should Pharmaceutical College Students Divide their Time between the School and the Shop? By O. Oldberg.—This paper was discussed at great length. J. P. Remington remarked upon the advantages of the pharmacist as being able to secure his education and pactice his profession at the same time. We must have the help of the shop. No college at present is sufficient to educate a man entirely aloof from the store. He argued that, whether the student is

under disadvantages by studying in college and working in a store simultaneously depends upon circumstances. With a good preceptor, in a large city, there are unquestionable advantages. C. S. N. Hallberg referred to the value of habits referred to in the address of Dr. Eccles—habits of cleanliness, neatness, accuracy, adaptability, etc., which are to be formed only in the shop. He remarked how difficult pharmacists found it to-day to secure clerks with such habits, that they can adapt themselves to store work. When the degree is given, the graduate should have had his practical experience. No preliminaries of experience should be secured before theoretical education, and the advanced experience might go hand-in-hand with the theory. S. A. D. Sheppard showed the practicableness of having the student in touch with the store during his entire course. A. E. Ebert argued that the first requirement of a student should be that he must possess two or three years' practical experience in a drug-store. After that the clerk is ready for theoretical instruction. The older countries are an example to us in this direction. Dr. Dohme contended that the requirements to-day of a pharmacist are higher than those required twenty years ago. O. Oldberg believed that store experience is necessary, but that the college is not the place to secure it. One thing only can be acquired at a time. Dr. Dadd believed that the young man is not educated in the store of to-day, and that it is necessary for him to go to college. Prof. Patch related his experience, that he knew of many students who received more instruction in one year in practical pharmacy in a college than in ten years in a store.

It was moved by H. R. Slack that "graduates in pharmacy be required to pass the State Board of Pharmacy examination before being registered." This was seconded and carried. Mr. Simpson, presented to the association the resolution passed by the International Pharmaceutical Congress, and after being seconded by O. Oldberg was unanimously approved. Upon motion it was ordered that a copy of the resolution be sent to the secretary of each state association.

"*Resolved*, That it is the sense of this association that no person should be admitted as an apprentice in pharmacy unless he shall have given evidence by satisfactorily passing a preliminary examination or otherwise, that he possesses a general education sufficient for such apprenticeship, and as advanced as the conditions of the practice of pharmacy in the United States permit, and his term of apprenticeship in pharmacy should in no case be counted so far as it may antedate such evidence of sufficient preliminary education.

"*Resolved*, That the period of apprenticeship in pharmacy ought not to be less than four years, including the time devoted by the apprentice to regular attendance upon the courses of instruction in a pharmaceutical school.

"*Resolved*, That this association approves the establishment of a compulsory curriculum of pharmaceutical education and holds that no person should be regarded as a qualified pharmacist who has not pursued to completion a systematic course of instruction in chemistry, pharmacognosy and pharmacy."

A resolution was framed by Mr. Payne relative to securing increased standing for the pharmacist employed by the United States Government. This was referred to the Association and favorably acted upon.

Officers for the ensuing year of this section are :

Chairman, Jas. M. Good, St. Louis, Mo.
Secretary, C. S. N. Hallberg, Chicago, Ill.
Associate, J. H. Beal, Scio, O.

The section adjourned at 12 P.M., and it was suggested that in the near future the Association must extend the time of its meetings in order that the papers on educational matters be considered.

Section on Commercial Interests.—The first session was almost entirely occupied with the question of free alcohol, and, after a lengthy discussion, which grew very warm at times, it was decided to appoint a committee to report at a future session. The second session was at first devoted to the "cutter," but later the free alcohol question came up, and a set of resolutions were presented, of which the vital one was as follows: "That the payment of rebate on internal tariff on alcohol, under section 61 of said act, be confined to alcohol used in the manufacture of those products in which the alcohol used is so changed as to lose absolutely its chemical and physical properties, including the class of chemical compounds known as the ethers, chloral and chloroform." After much discussion the resolutions were adopted. Geo. J. Seabury was elected chairman, and L. F. Chalin secretary of the Section for the ensuing year.

OBITUARY.

Wm. Norwood Needles, Ph G., Class 1845, died at his residence in Germantown, Tuesday morning, April 17, 1894, aged 70 years. He was born in Philadelphia, his father being Edward Needles, who kept a drug store at Twelfth and Race Streets. In his early years he adopted his father's profession and attended the Philadelphia College of Pharmacy, graduating in the Class of 1845. After a few years devoted to the drug business, he relinquished it and became connected with the oil firm of Allan & Needles, carrying on business at Delaware Avenue above Chestnut Street for more than twenty-five years. In 1874 he retired from business, removed to Germantown, and devoted his time to his garden and the cultivation of flowers, of which he was extremely fond. He was a devoted husband and father. His wife and one daughter survive him, the latter being the wife of Frederick J. Kimball, President of the Norfolk and Western Railroad. The late Caleb H. Needles, Ph.G., who was formerly proprietor of the pharmacy at Twelfth and Race Streets, was a brother. His remains were interred in Laurel Hill Cemetery.

Ernest Bartram, Ph.G., Class of 1867, died at Brooklyn, N. Y., on Wednesday, May 9, 1894, in his forty-eighth year. He learned the drug business with Thos S. Wiegand, Ph.G., at Fifteenth and Race Streets, and when Mr. Wiegand sold his store he remained with Samuel T. Jones, Ph.G., the purchaser, and graduated from the College in 1867. After his graduation, he entered the employ of Bullock & Crenshaw, at Sixth and Arch Streets, for a short period, and becoming tired of the drug business, he abandoned the profession and went upon the stage, and was a very successful actor of old men's parts. He was a member of Wm. Gemmill's Stock Company in the old Chestnut Street Theatre, and afterwards was "on the road" with a number of theatrical companies. His last appearance in Philadelphia was with the Roland

Reed Company. He was well liked by the members of his profession. His remains were brought to Philadelphia and interred at Laurel Hill Cemetery, Saturday, May 12, 1894. He was an active member of the Alumni Association of the Philadelphia College of Pharmacy and also of the Actors' Order of Friendship.

NOTES.

We do not believe it would be an exaggeration to say that the phosphate of Florida amounts to more in value than the coal and iron of Alabama or Pennsylvania. Certainly it is more valuable than the gold of California. If Florida had no other resources, this alone would make her one of the richest States in the Union. As a matter of fact, however, it is only one of many.—*Florida Facts.*

Speaking of the moss industry, the *Florida Citizen* says: The statistics compiled by the State Agricultural Department show that while this is yet an "infant industry," about 50,000 bales are annually exported from the State, bringing a return of not less than $400,000. There is no good reason why these figures should not be multiplied ten times. The business is one requiring little capital, and the proportion of profit is more than can be realized from most sources with the same investment.

Rice is rapidly becoming a staple and profitable crop in St. Johns County, Florida. One farm of especial interest, as demonstrating the agricultural possibilities of the county, is that of Mr. H. M. Flagler, of New York. It is in the little town of Hastings, not far from St. Augustine, and is under the management of Mr. Mott. There has just been harvested from the farm 1,200 bushels of as fine quality of rice as can be grown anywhere in the world. This is the first crop from the land after the clearing, and it marks the beginning of rice culture on an extensive scale in several of the east coast counties.—*Florida Agriculturist.*

According to *Garden and Forest* (September 26, 1894), some of our native persimmons have been received in New York from Decatur County, Indiana, which were picked before there was any sign of frost, and yet he pronounces them entirely free from anything like the astringent or puckery quality generally supposed to be characteristic of this fruit until it has been chilled out by a good freezing. These persimmons were pronounced superior in flavor to any of the Japanese kinds; they averaged in size about an inch and a quarter in diameter, and were almost seedless. They were richer than many of the popular varieties of plums, and, if any objection to their quality could be noted, it was that they were too sweet. There can be no doubt that by selection, and, perhaps, by hybridizing with the foreign varieties, our native persimmon could be developed and improved into one of the most luscious of fruits.